

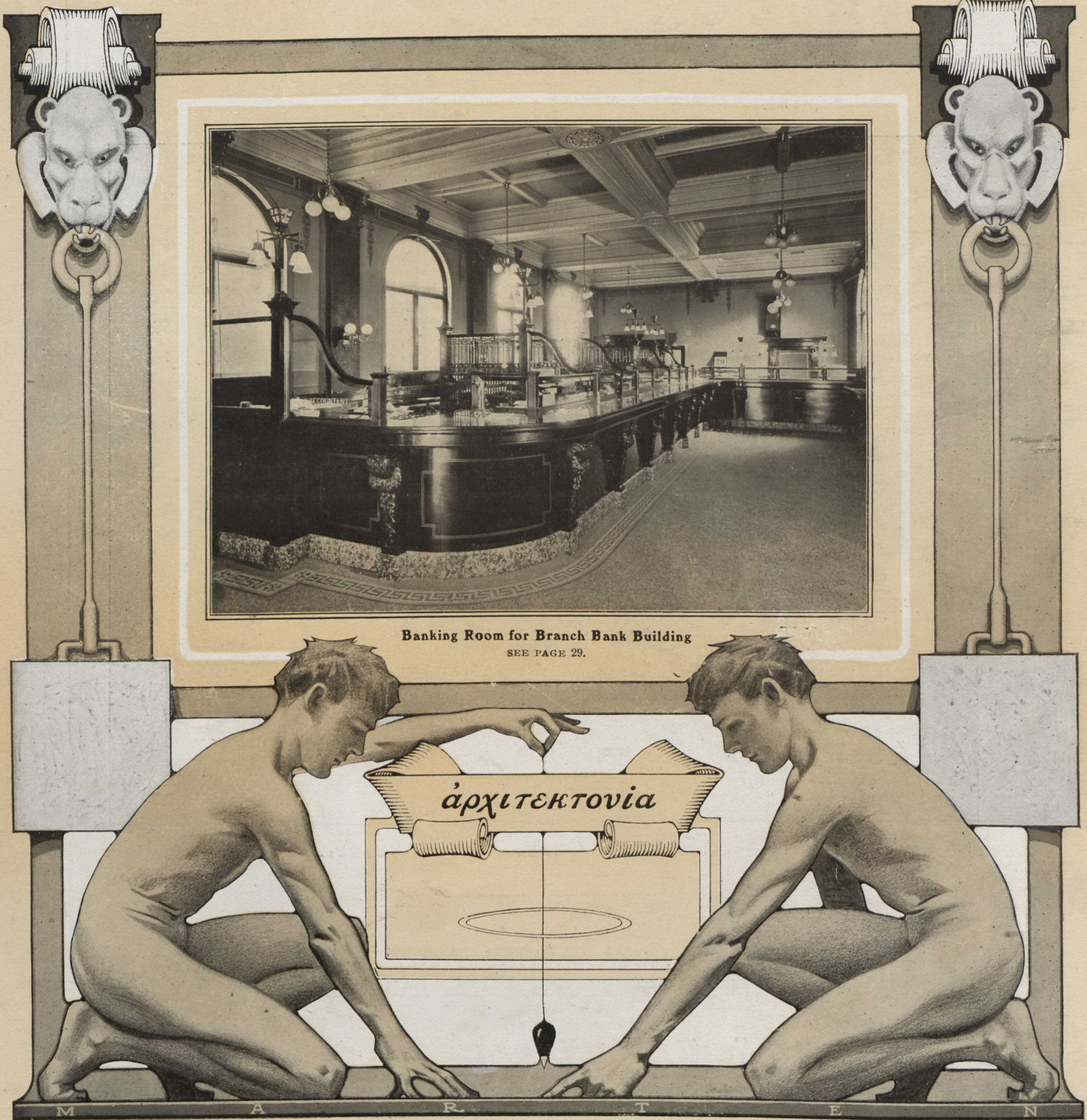
CONSTRUCTION

A JOURNAL FOR THE BUILDING AND
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Vol. I, No. 7.

MAY, 1908

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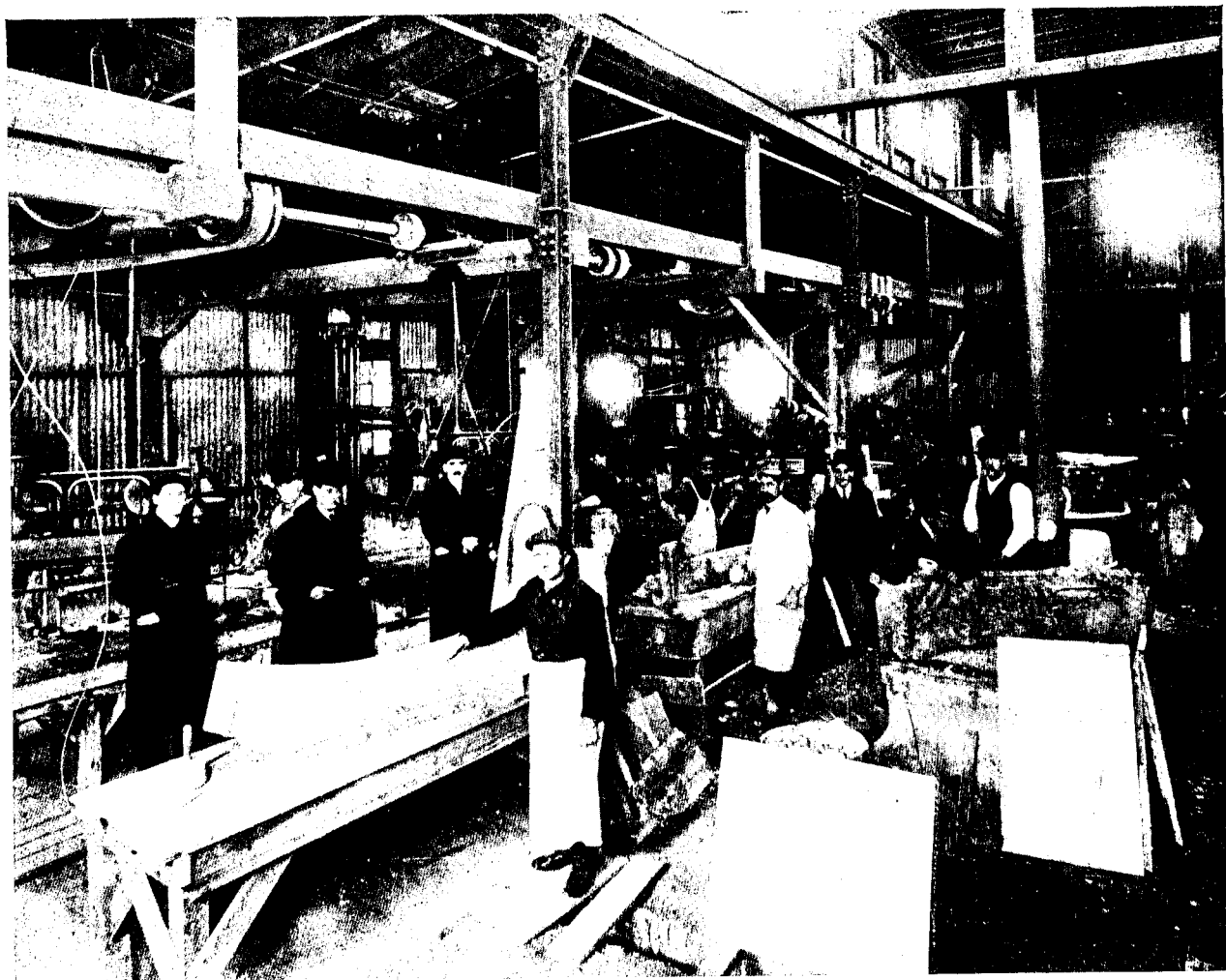
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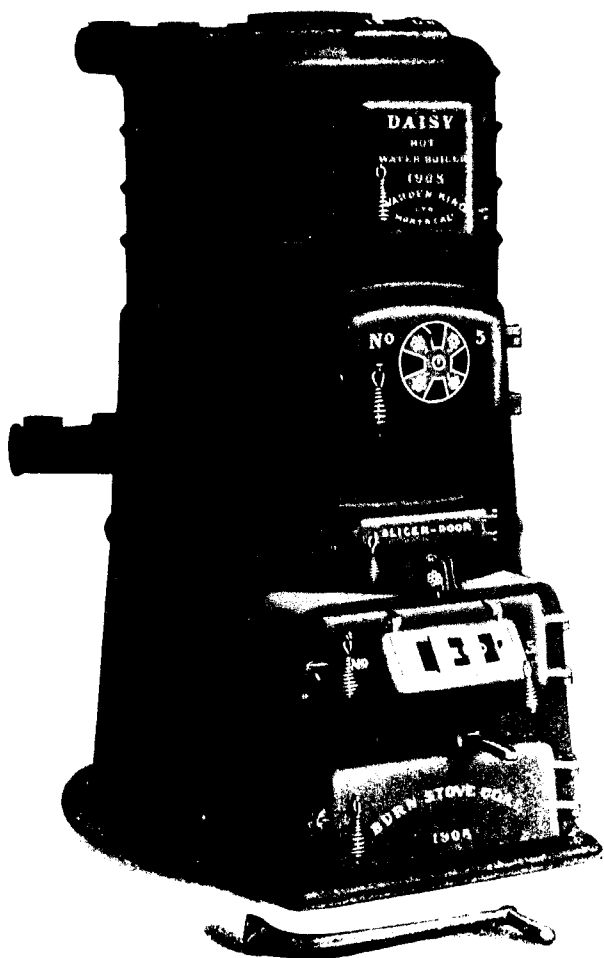
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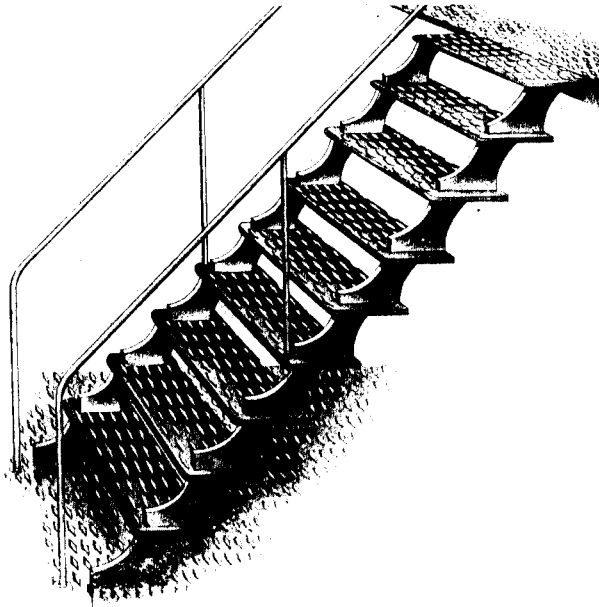
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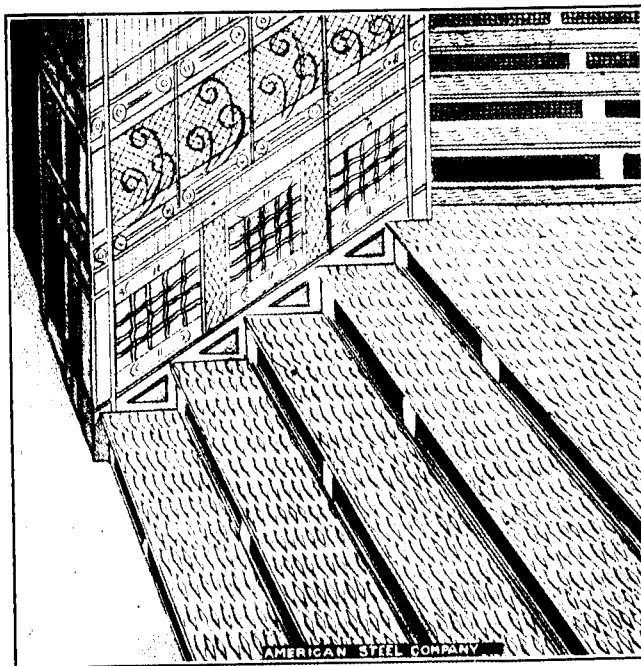
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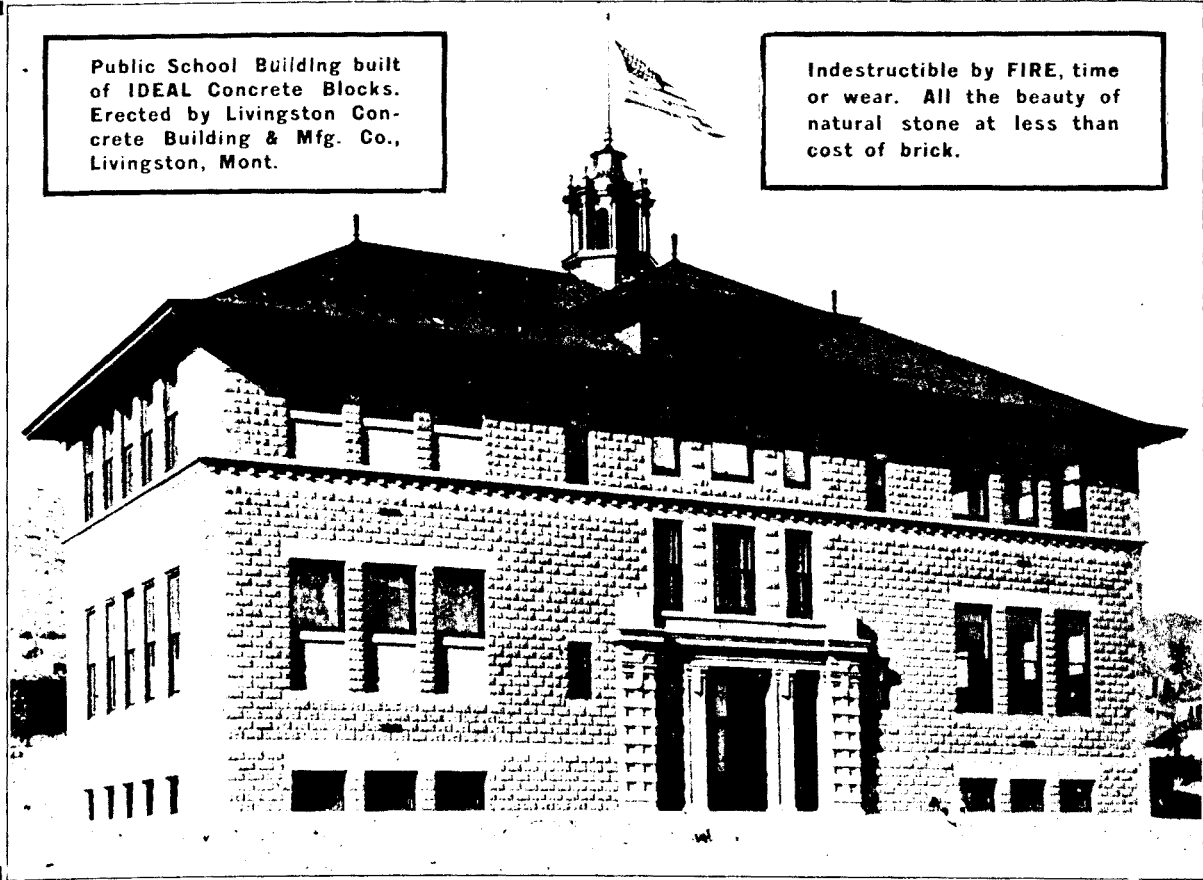


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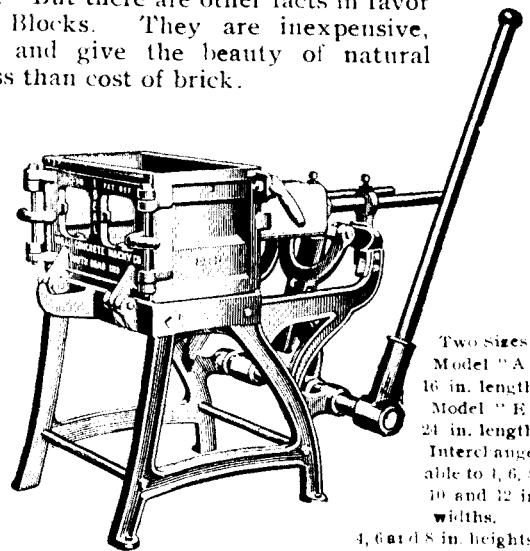
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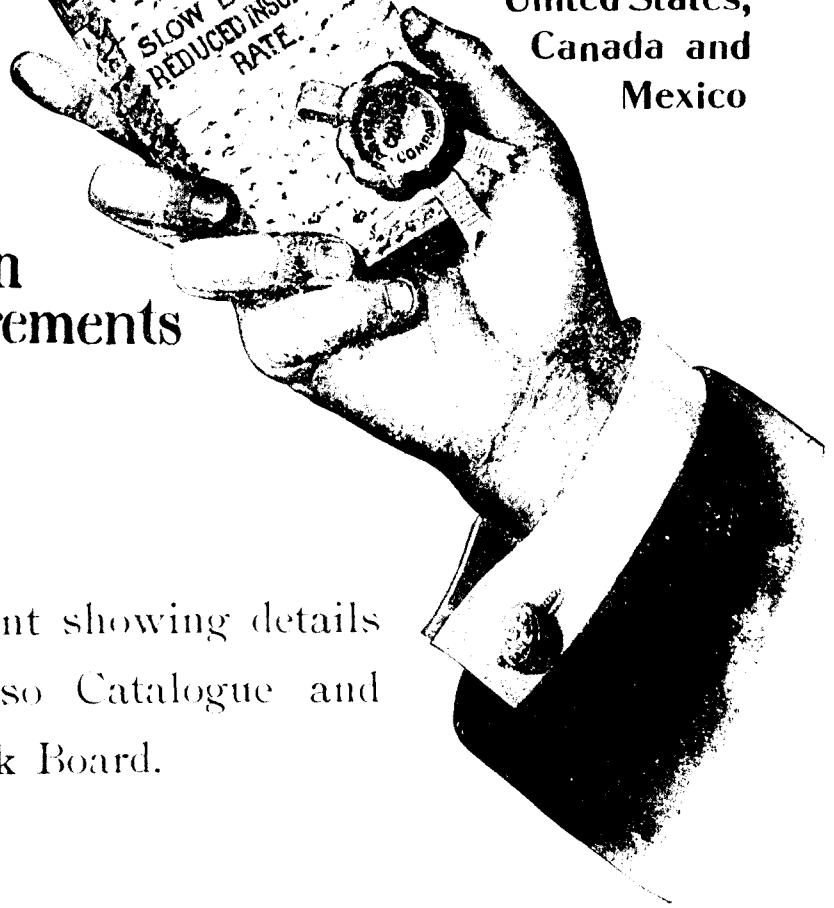
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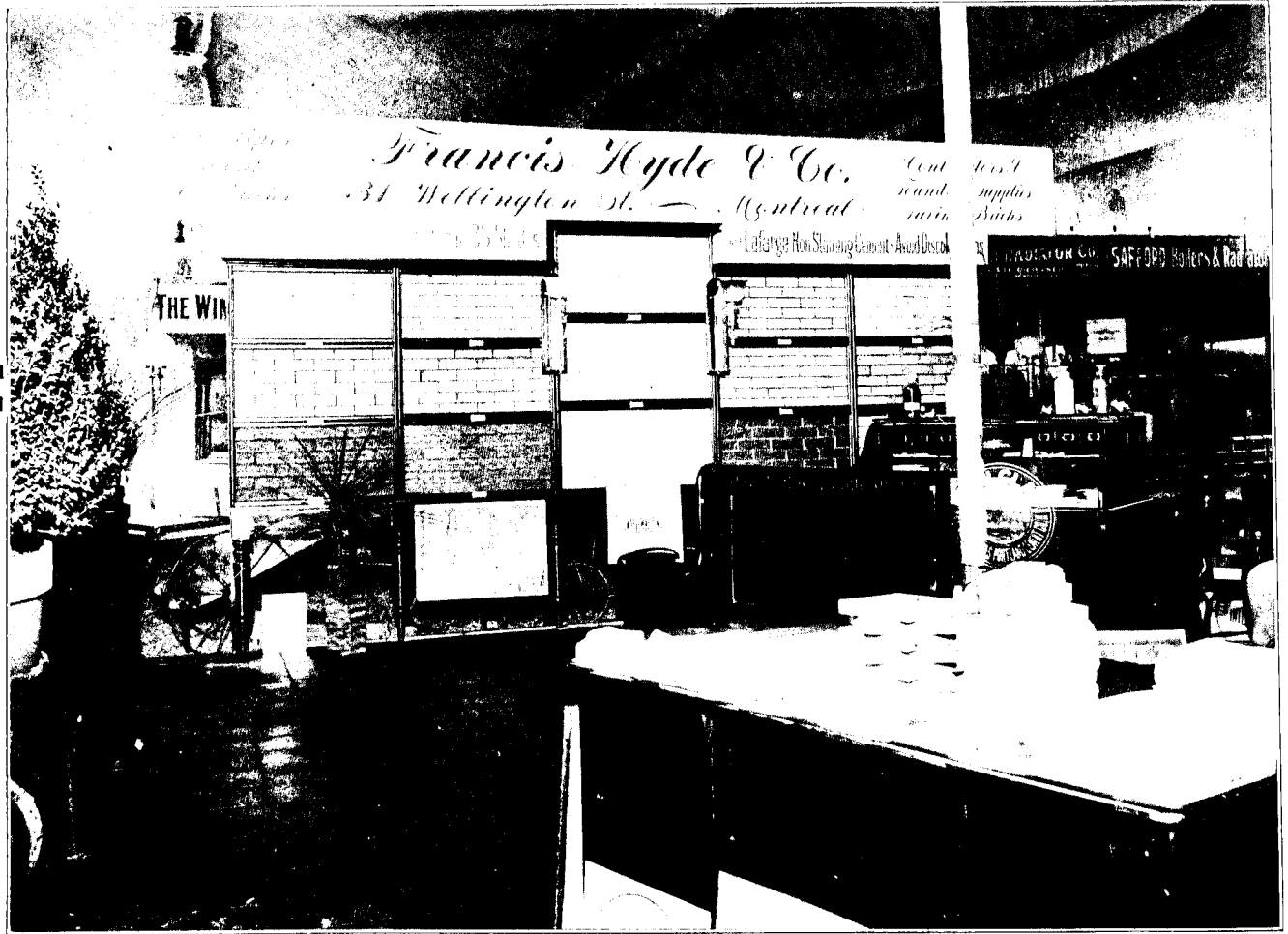
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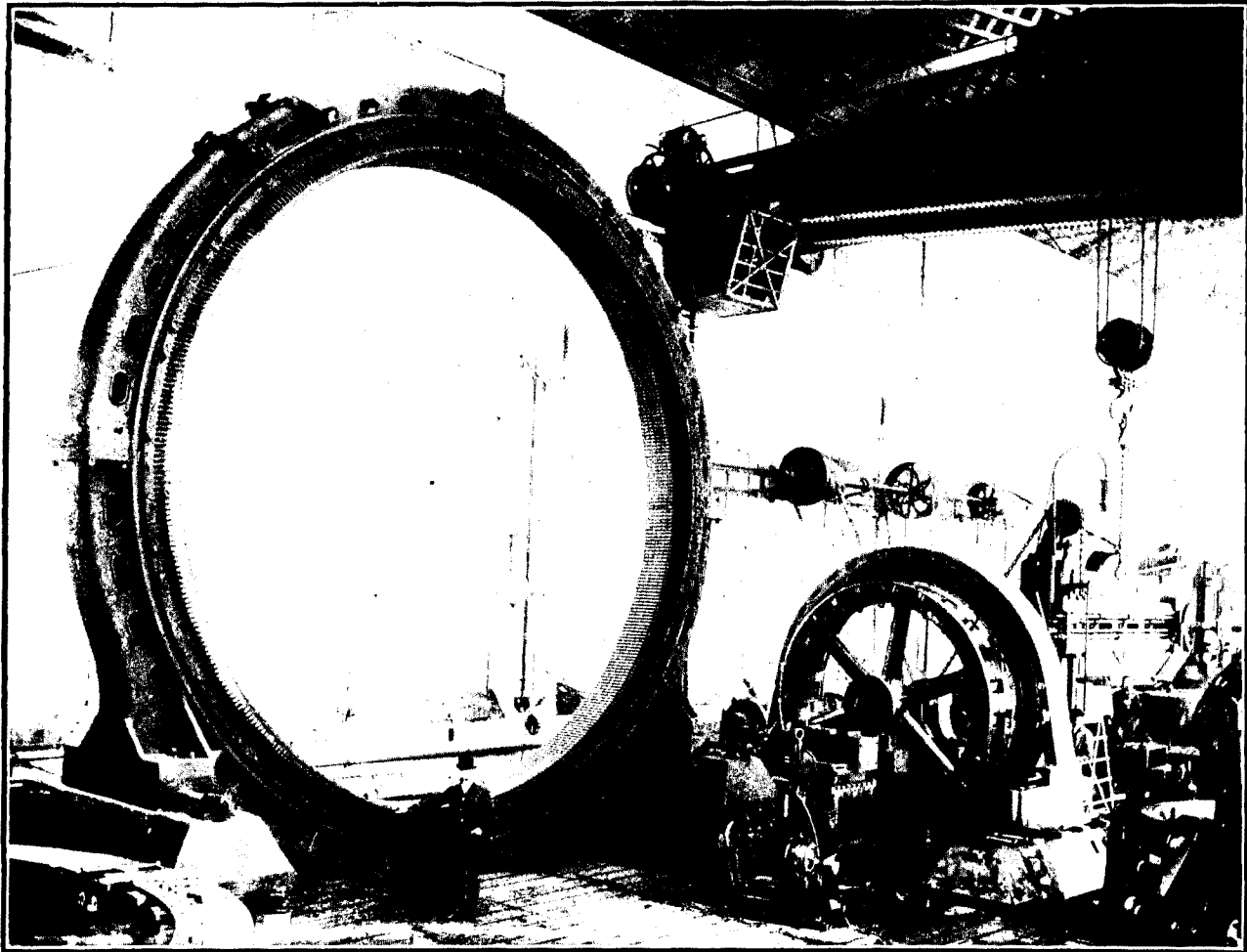
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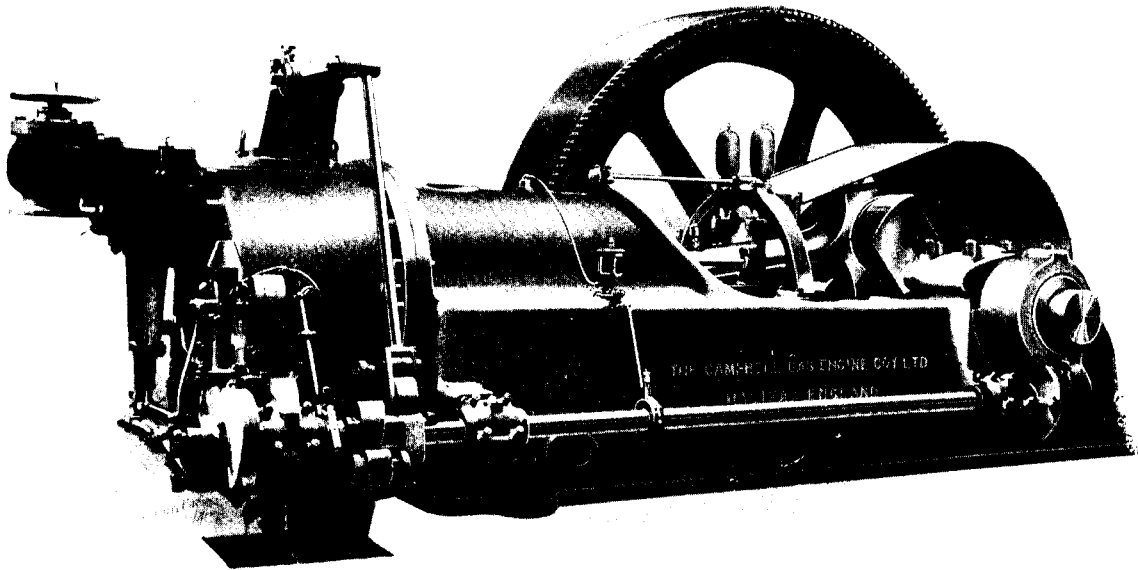
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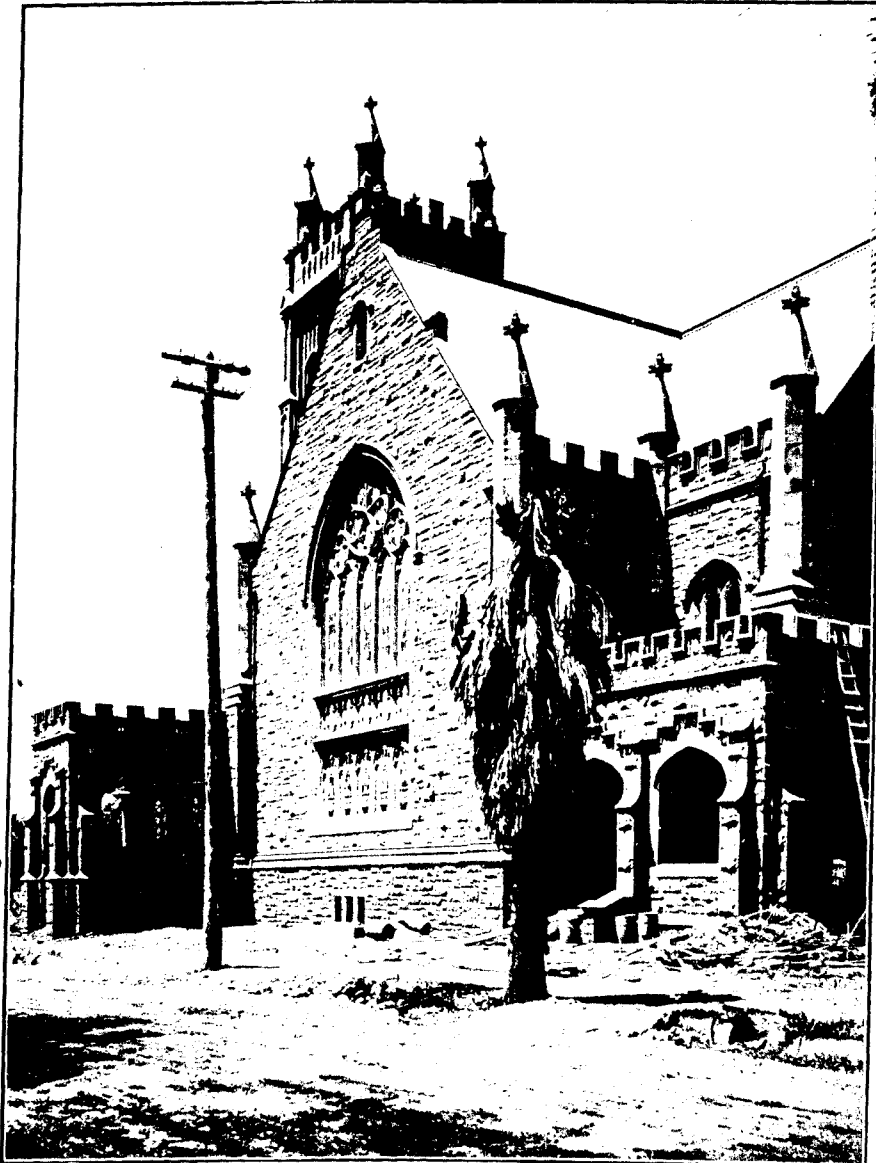
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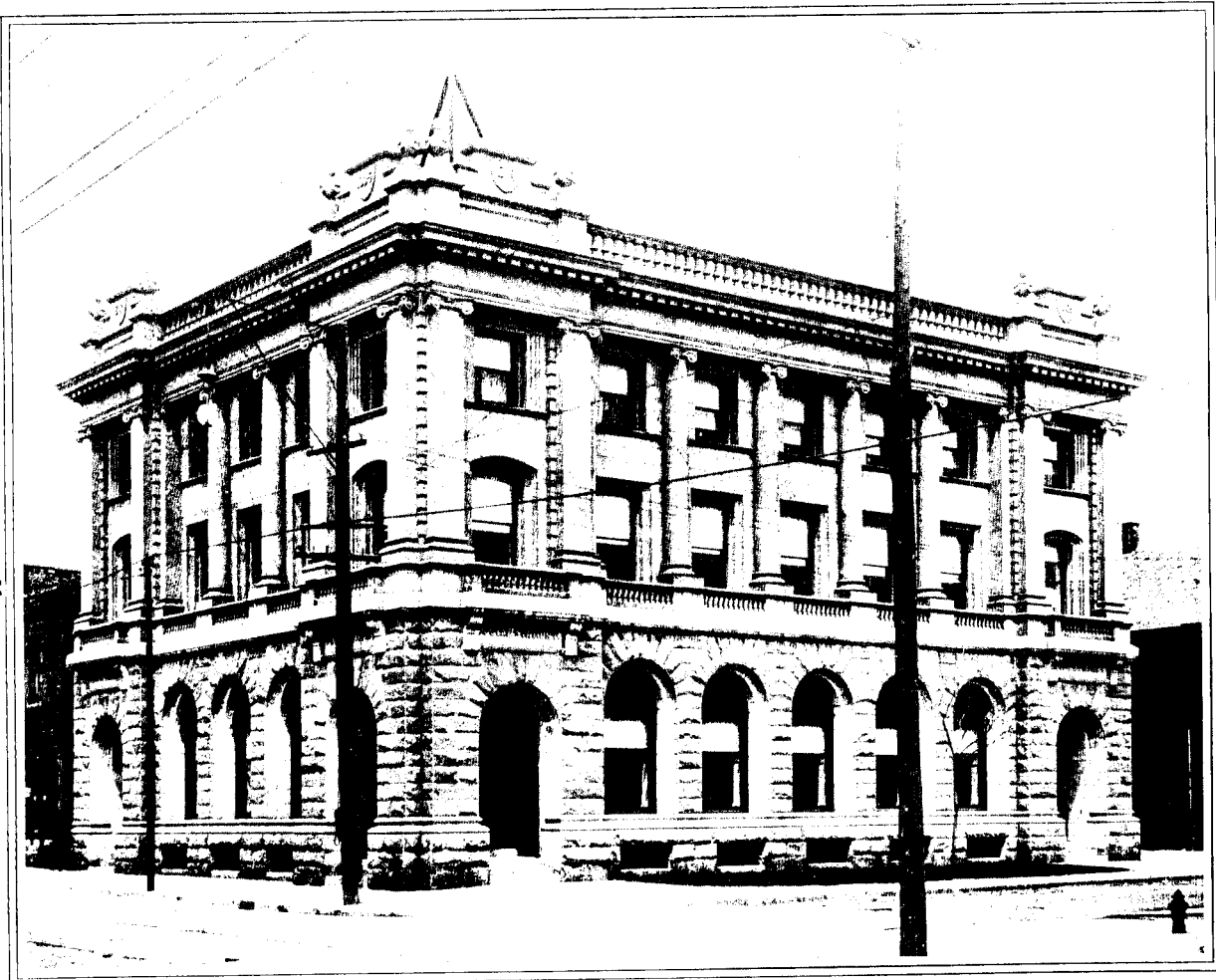
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Vol. 1

May, 1908

No. 7

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Terms of Subscription: Canada and Great Britain \$2.00 per annum, single copies 25 cents. United States, the Continent and all Postal Union Countries \$3.00 per annum in advance. Entered as Second Class Matter in the Post Office at Toronto, Canada.

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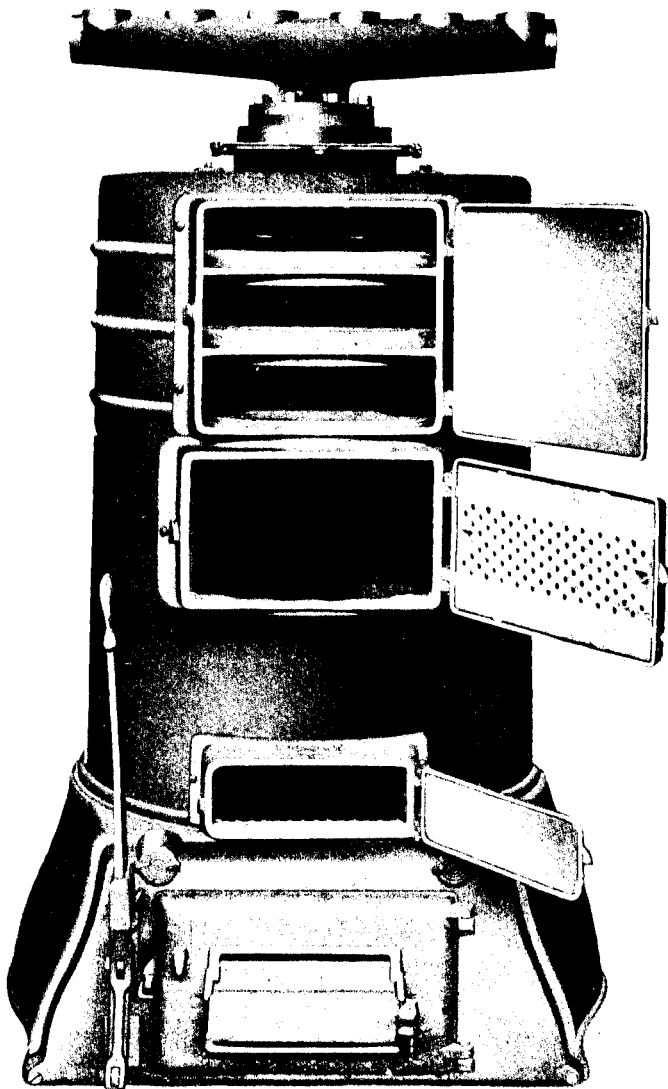
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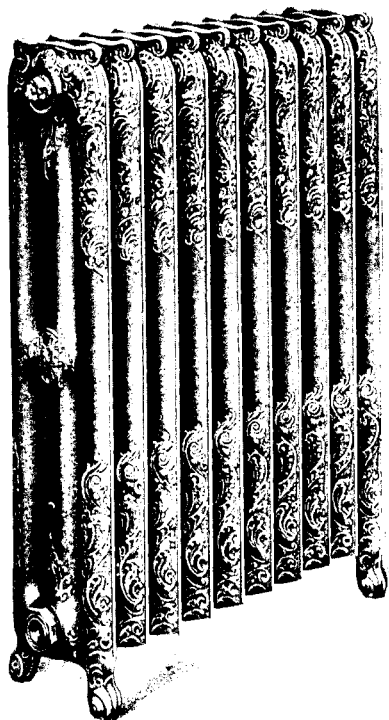
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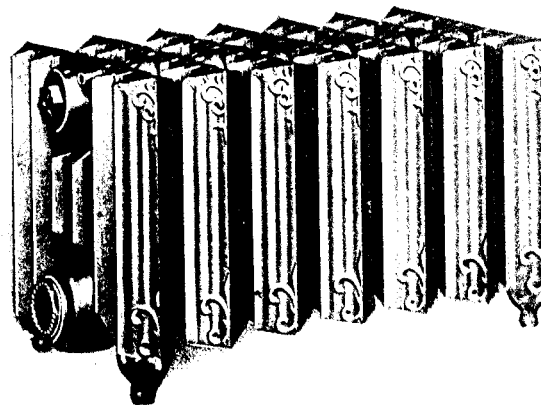


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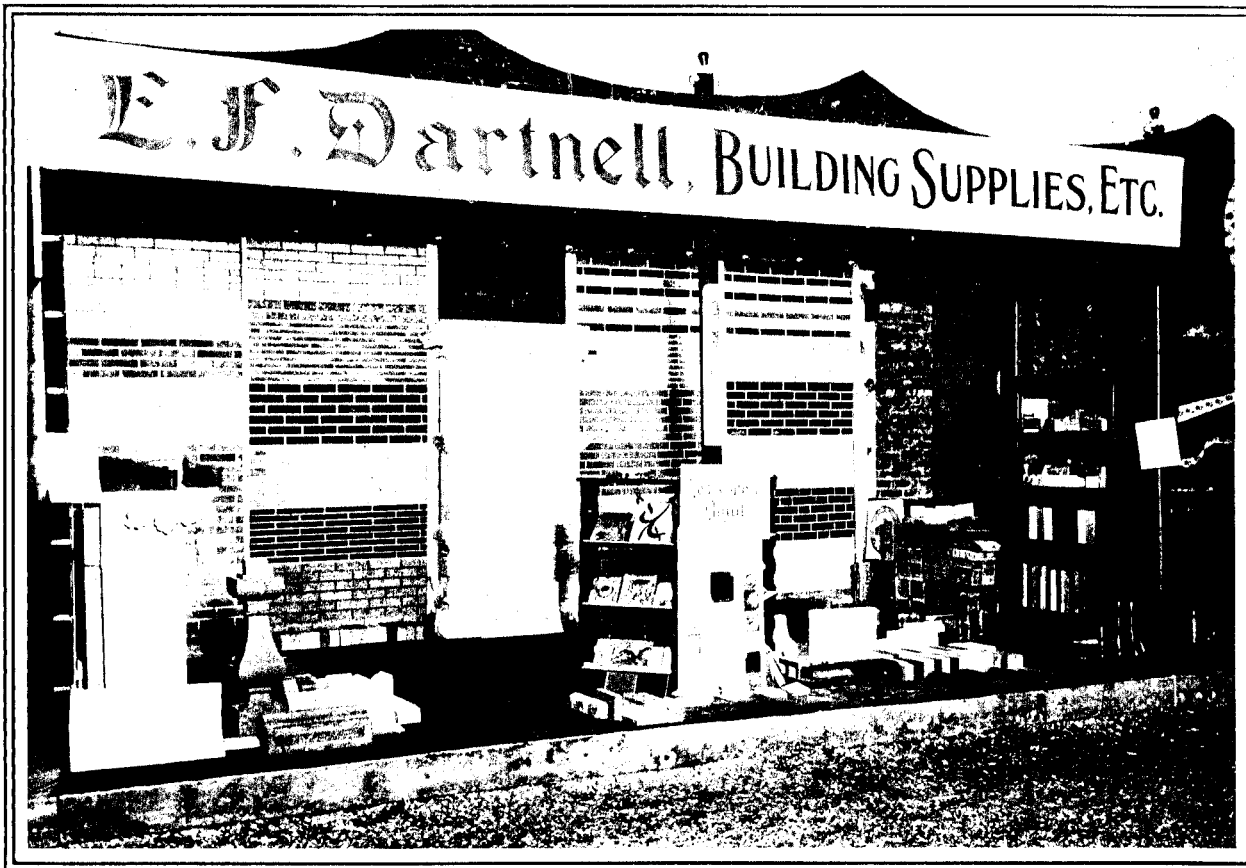
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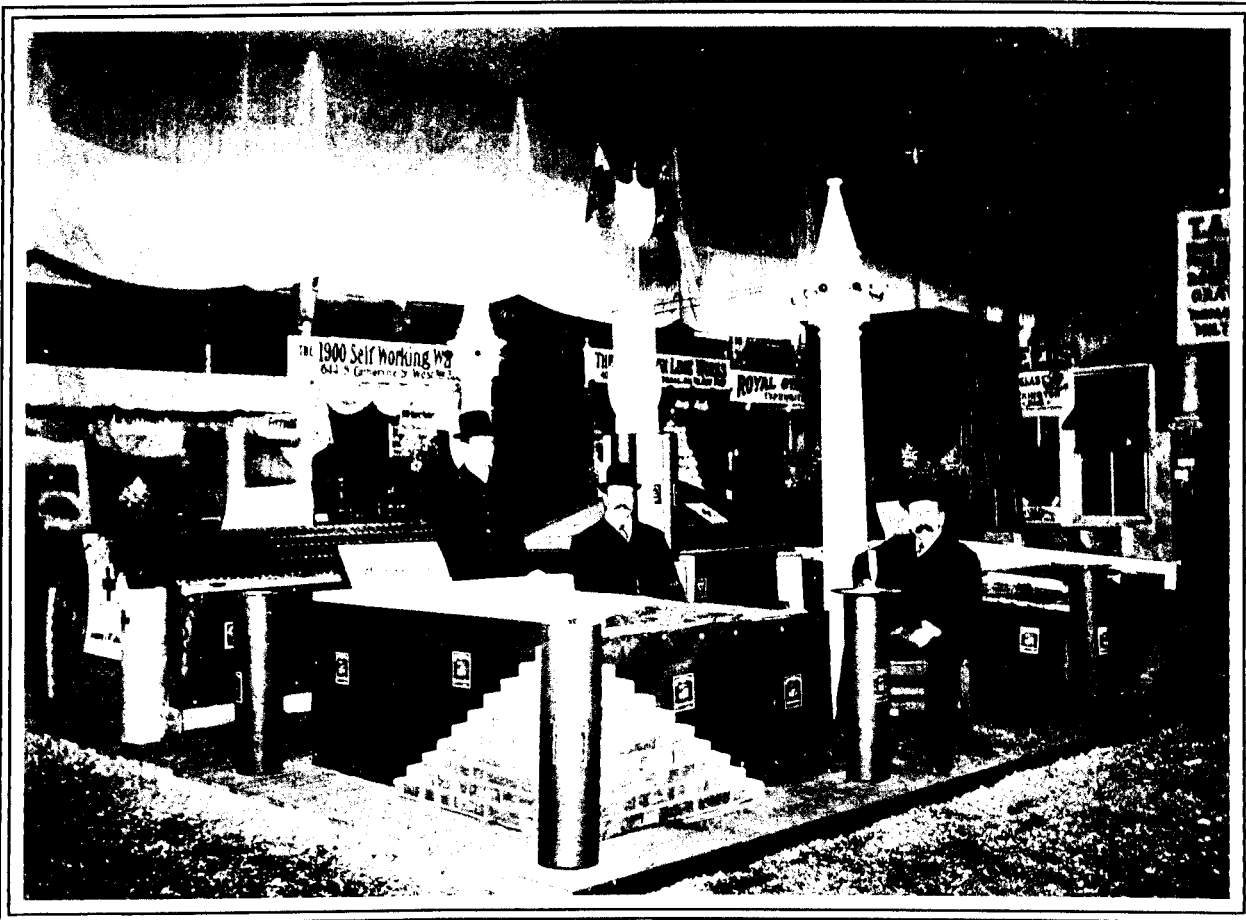
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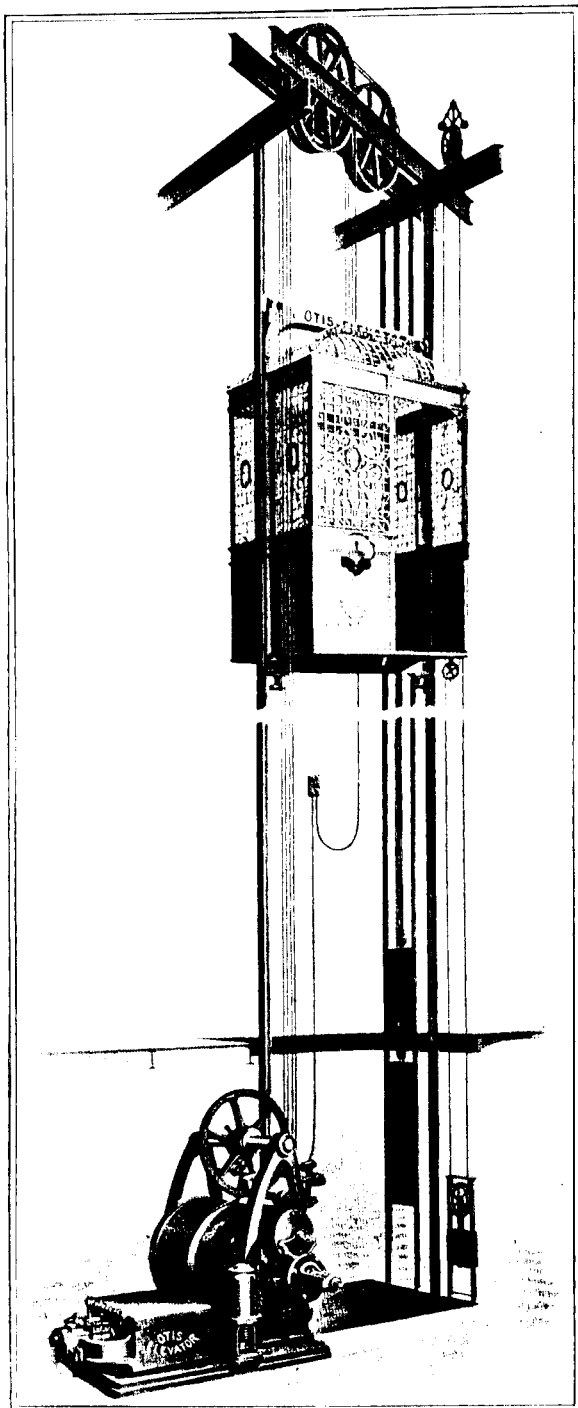
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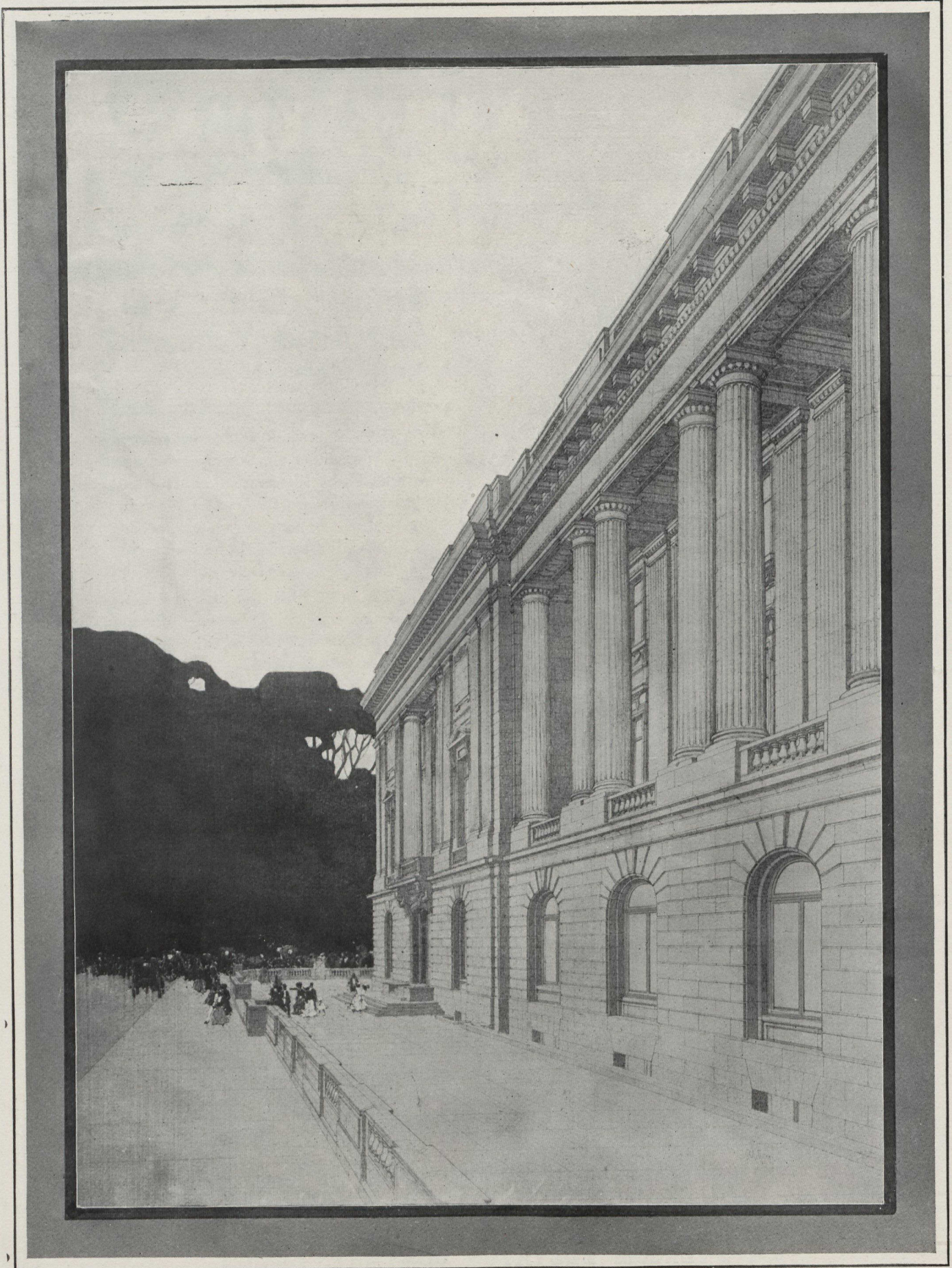
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*GREAT ACTIVITY IN SCHOOL BUILDING
CONSTRUCTION — WINNIPEG LEADS —
TORONTO'S SCHOOLS A DISGRACE TO
THE CITY.*

SIX HUNDRED thousand dollars has been voted by the citizens of Winnipeg for the construction of new school buildings. These figures will undoubtedly stagger our worthy taxpayers in the East, who are plainly of the opinion that such an expenditure on school structures is nothing short of wanton extravagance. There is no city of its size on the continent that has a poorer class of public school structures, both from the standpoint of design and construction and equipment than has Toronto, yet no city boasts more loudly of its *unexcelled* educational facilities than does the Queen City.

There is no reason why Toronto should not lead all other Canadian cities in the matter of the excellence of its school buildings, and as Canada's greatest educational centre set the standard for this important class of construction in the Dominion.

But we find that that august body of moral reformers known as the people's worthy representatives, the City Council, not only refuses to replace the many poorly planned, badly constructed, totally inadequate schools now in use, but has refused to expend sufficient money to render them in the least degree fit for their use with any measure of safety by equipping them with fire escapes. Think of it, fire traps used as school buildings, three storeys high without any provision being made for emergency exit in case of fire or panic. The school inspector, we learn, states that in his opinion fire escapes are useless and unnecessary. Who is this man that takes it upon himself to declare against that which the most eminent authorities have approved as a necessity, and experience in every fire has shown to be not only practical but indispensable in operation?

It may be too much to expect an official, after having neglected the proper equipment of the schools under his department to admit when public interest is aroused by such a catastrophe as that at Collinwood, his gross negligence of many years. But when the lives of thousands of school children are at stake the public should not permit an official to stand on ceremony.

As against this, however, we are pleased to learn that a movement is now on foot to provide for the erection of only fireproof school structures in Toronto in the future, and it is to be hoped that should this highly commendable class of construction be adopted an architect of ability and practical experience in public school architecture, with a knowledge of fireproof construction, be employed.

But Toronto is slow in such matters, and if the progress she has made in the building of her union station and the adoption of a parks system, is to be taken as a criterion we are led to believe that the school children of to-day will be grandfathers before a fireproof school will materialize in the Queen City.

In the meantime Winnipeg has voted six hundred thousand dollars for school buildings, a sum which will provide fireproof buildings with complete modern equipment, that will accommodate five thousand school children and judging from the manner in which the progressive citizens of this great western metropolis do things we are prompted to believe that they will ere long enjoy the enviable reputation of having the finest public school buildings in Canada.

Never in the history of Canada has an occurrence brought about the full realization of the disgraceful condition of our public school buildings as did the Collinwood disaster. Schools are being erected by scores all over the Dominion, and while most of them are not fireproof they are immeasurably better structures than the buildings we have generally been accustomed to.

"Construction" reported during the past month seventy-nine proposed school structures to be erected in various parts of the Dominion. The city of Hamilton alone is erecting or remodelling five buildings, at a cost of about \$250,000. Twenty-nine are reported from the province of Ontario, four from Quebec, four from the Maritime Provinces, five from Manitoba, in addition to those provided for by Winnipeg's appropriation of \$600,000, five from Alberta, fifteen from Saskatchewan, and two from British Columbia. All these were reported during the past thirty days, and their large number indicates an awakening that we hope will have the still better effect of producing a higher standard generally in the buildings in which young Canada is prepared to take his part in the development of this great country.

*LAX BUILDING LAWS—SHODDY CON-
STRUCTION — A SMALL FLAME—HIGH
WINDS AND A GREAT CONFLAGRATION.*

THE CONFLAGRATION which wiped out a large part of the city of Chelsea, near Boston, emphasizes the well known, much talked of, but little heeded danger that lurks in the "shoddy" nature of the predominant methods in building construction on this continent.

The fire fiend boldly takes in his bountiful harvest of property and life, while we, despite the repeated warnings of dearly bought experience, continue to sow the seed of disaster. Our daily, weekly and monthly journals print hundreds of columns of unmistakable statistics showing the folly of our short-sighted economy in the use of flammable building materials, and the adoption of cheap, ramshackle methods of construction.

A very small additional expenditure relative to the loss would have made every Chelsea factory more or less fireproof and have rendered this disastrous conflagration impossible, but insurance premiums spread over the years are easier to meet than the single payment involved in the additional cost of permanent construction.

There is no reasonable argument that can be advanced in protection of the use of wood frame work, shingle roofs

and flimsy construction in factories, business buildings, schools, or public buildings. Nobody pretends to defend this class of construction; everybody who knows condemns it, but a glance over the building permits issued daily in any of our cities shows that the majority of structures erected are constructed along lines condemned generally by the better judgment of the well informed and the popular opinion of the masses. This condition obtains everywhere, in our cities and in our towns, and fire and high wind will together bring the same result as they did in Chelsea. They did in Toronto. They did in Baltimore. They did in St. John. They did in Hull. They will in the next place where fate falls, wind blows and the sun shines.

The extent to which this criminal shortsightedness has this continent in its grasp is demonstrated by the official statistics, which show that in the building operations in the principal cities in Canada and the United States last year, despite the great increase in the use of cement, steel, brick and stone in the recent past, 59 per cent. of the new construction was of wood.

Every fire destroys property, and insurance does not restore loss. It merely equalizes it, so that the whole damage does not fall upon one or a few individuals. But the wealth of the country is diminished every time the flames lick even a woodshed from the earth into the heavens. We should build structures that will not burn. They do it in England. They do it in Germany. These older countries hardly know what a fire larger than a boufire looks like.

Canadian municipalities should perfect their building and fire by-laws, and compel their observance to the letter. Architects and contractors should use their influence with the owner and point out the inevitable result of using flammable materials and cheap construction, and if individuals will not build secure shelters for themselves or their business without compulsion, a paternal government should see to it for them.

BIG FIRES AND TIGHT MONEY—APPALING FIGURES OF OUR FIRE LOSS—FAULTY BUILDING METHODS THE CAUSE.

WHILE our wizards of finance are busy endeavoring to solve the problem of "tight money" it might be well to consider for a moment the vast sum of money that annually goes up into smoke. We learn that the actual fire losses in Canada and the United States during the past three years aggregated \$850,000,000—a sum nearly equal to the total capital stock paid in of the chartered banks of Canada and the national banks of the United States. This tremendous destruction of property is equivalent to a tax of nearly \$10 upon every man, woman and child in the Dominion and the United States. This year, even before the Chelsea fire, the average loss per day in both countries was nearly \$600,000.

There are no such losses in European countries, and the safeguards they have established against fire are none other than those rendered possible through the same construction of their buildings, and it is only fair to assume that these same precautions can be established on this continent by the same sane methods. According to European standards the fire loss of Canada should be only about 22 per cent. of what it is at present.

After every big conflagration there is nearly always a good deal of talk about the "benefit" which such a loss confers upon the building trades, as if destruction of property could ever be in any sense of the word a benefit. After the San Francisco disaster, for instance, much was said about the immense activity which the destruction of that city would give to the building and kindred trades, as it would stimulate an unusual activity by reason of the large demands for materials. The fact that the disaster

at San Francisco meant the wiping out of property, a total loss which had to be borne by somebody or other, did not seem to appeal to certain minds. No doubt that some people regarded the insurance paid them for property destroyed by fire as in the nature of money found, or at least of a quick and convenient way of transferring real estate into cash.

There is a little of such reasoning now. The panic of 1907 is now seen to have had a starting point in the San Francisco earthquake and fire early in 1906. Then began that liquidation and decline in the stock market which has kept up ever since, and which, in October, 1907, culminated in the great crisis. While the San Francisco fire was not, of course, the main cause of the panic, it was one of those big wastes, like war and famine, which go to make up a heavy loss to the world, and which must be paid for in some way or another.

Something effective must be done to prevent this terrific waste by fire. Our Dominion Parliament now has before it several measures for the prevention of the waste of our forests. Should some attention not be given to the adoption of means for the prevention of waste by fire? Modern building science has shown the way, in providing methods and materials that may be economically used in the construction of fireproof buildings.

If owners refuse to take advantage of these and insist upon borrowing from to-morrow and gambling with the future, our municipal governments should enact laws that would force them to respect the interests and welfare of the community. If municipal governments refuse to act our provincial governments should take the matter in hand. Education and experience seem to have had little effect, and it appears quite plain that more stringent laws governing the construction of our buildings is necessary.

O.A. OF A. WITHDRAW'S BILL FOR REGISTRATION OF ARCHITECTS—STRONG OBJECTIONS TO MEASURE FROM MANY QUARTERS.

A GAIN HAS the Ontario Association of Architects failed in its efforts for the passage of a law providing for the registration of architects in the province of Ontario. Following so closely upon the withdrawal of the close corporation clauses in the Dominion charter, recently granted the Architectural Institute of Canada, it would appear to many that public opinion is not in favor of legislation designed to regulate and control the profession of architecture, and that it will be some time before legislators will consent to pass a measure requiring the registration of architects. While this to some extent may be true, it still remains a fact that the nature of the bills thus far presented to either the Dominion or the Ontario Governments have had so many strings tied to them that their rejection cannot be accepted as an indication that public opinion is not in favor of a law providing for Government registration.

The Architectural Institute of Canada asked to be empowered to control the title of architect and the admission to the practice of architecture. Many of the members of the profession were justly hostile to this measure. Public opinion rightly opposed it. The daily press consistently criticized it, and the Government judiciously declared against it.

The Ontario Association of Architects asked the Provincial Legislature to enact a law to require the registration of all architects practicing in the province, and place the right of conducting examinations either in the hands of the Association or the Toronto University. Many prominent architects of the province actively opposed it. The daily press objected to it. The University was not in favor of it, and the Legislature was not inclined to pass it. Some architects opposed it on the ground that the law, as proposed, would not produce the desired results, and that the standard of the profession would not be raised by

placing the conducting of examinations with any other body than the Government itself. The daily press opposed it because it was purely class legislation, that would operate to benefit a few at the possible expense of many. The University opposed it on the ground that they did not wish to conduct examinations apart from those provided for in the University curriculum, and objected to having the Association which not giving tuition conduct the examinations, thereby setting up and controlling a standard independent of that established by the University.

The difficulty with the whole affair lies simply in the fact that the Association wished to hold certain strings to the power of conducting the examinations and the issuing of certificates. Architects who were not members of the Association justly objected to the measure, and even though the University had consented to conduct the examinations, it is quite improbable that the law would have passed. It would have been quite unfair to the architect without academic training to have required him to take an examination before a University board, and it may here be stated that many excellent architects have never had the advantage of a college course.

Had the Association simply asked for a law providing for a straight governmental registration of architects, which provided for a board of examiners independent of any architectural association or university, and directly responsible to the Government, it would have in all probability been successful. However, it is contended by some that examinations conducted in this manner would produce building inspectors instead of architects. We answer that this is far from the case in the States of Illinois, California, and New Jersey, where laws of this nature have been in successful operation for some time.

Public safety and welfare demands only that an architect should have sufficient practical knowledge of building design, construction, and materials as well as the laws of sanitation, to be allowed to practice his profession, and it is highly improbable that the public will grant any powers to individual organizations to limit the profession along narrower lines than required in the intelligent design and construction of their buildings.

*GOVERNMENT REGISTRATION ONLY
SOLUTION TO PROBLEM—HIGHER EDUCATION
IN ARCHITECTURE A SEPARATE
QUESTION.*

THE ONTARIO ASSOCIATION of Architects have sought the passage of a law which they believed would have the effect of combining education and registration, and if their proposition did not promise to create evils and injustices of greater import than those it aimed to correct it would be a highly commendable one. But the public rightly fears monopolies created by the establishing of close corporations such as the Law, Medical and Dental Associations, and the Government does not dare to legislate any more into existence.

The Government should in justice to the architectural profession and the citizens of the province of Ontario, create by law a standard of practical knowledge and standing which should govern admission to the practice of architecture. But it must recognize the individual rights of the citizen to follow his chosen occupation, it matters not to what association he belongs, or does not belong, nor whether he acquired his knowledge or education through practical experience, correspondence schools or a university course. As long as he is competent to safely and honestly design and superintend the erection of a structure in keeping with the requirements of the law and the desires of his client, he should not be debarred by law.

The Government should aid and encourage architectural education; the importance of the profession deserves it, and the interests of the individual citizen and the community in which he lives demands it. But we contend that the encouragement of higher education in archi-

teature should be considered quite apart from the knowledge and ability required by law of the intending architect before he is granted a license to practice.

Should the architectural profession generally in the province of Ontario petition the Government at its next session to pass a law providing for purely Government registration of architects, based solely upon the actual knowledge and experience that one should possess before he is capable of intelligently planning or superintending the construction of a building, we are quite satisfied that their bill will be made law, and a very material step forward would be made in the raising of the standard of the profession and the development of a better class of architecture and building construction in Ontario.

*UNJUST CRITICISM OF THE ARCHITECT
WHO IS NOT WHOLLY TO BLAME FOR
THE FAULTY CONSTRUCTION OF OUR
SCHOOLS.*

IN COMMENTING on an editorial in Collier's Weekly, regarding the Collingwood school disaster, one of the country newspapers remarks: "This is a pretty severe arrangement, but are school trustees entirely to blame for the criminal negligence to which Collier's calls attention? What about the responsibility of the architects? In most cases the later are mainly responsible."

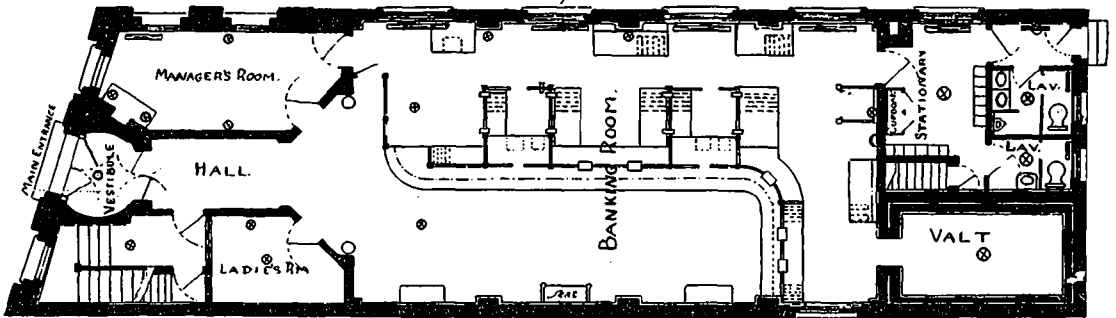
The writer, however, has failed to point out in what particular the architects are responsible. We know that they are the ones who design the structures, and we appreciate the fact that misfortunes like the Hochelaga and Collingwood disasters demand that something should be said on the part of the press as to where blame lies. Most editors gather their facts, weigh them carefully and intelligently and then prepare to sharpen their ax. And well that they should, as it is only by these spasmodic spurts of activity that any reform in providing more adequate means for the protection of life and property is accomplished at all.

The great danger of attempting to criticize, however, is when an editor borrows another's ax and tries to put a new edge on it. If he is not acquainted with the nature of the steel he is liable to blunt the tool and, in wielding it, strike a glancing blow, and thereby hit the wrong object. This is precisely what has happened in the above case, and it is evident that the author of this somewhat naive, and yet absurd, statement has not delved very deeply into matters pertaining to school construction, and is unfamiliar with the conditions which lead up to the acceptance of plans for buildings of this character.

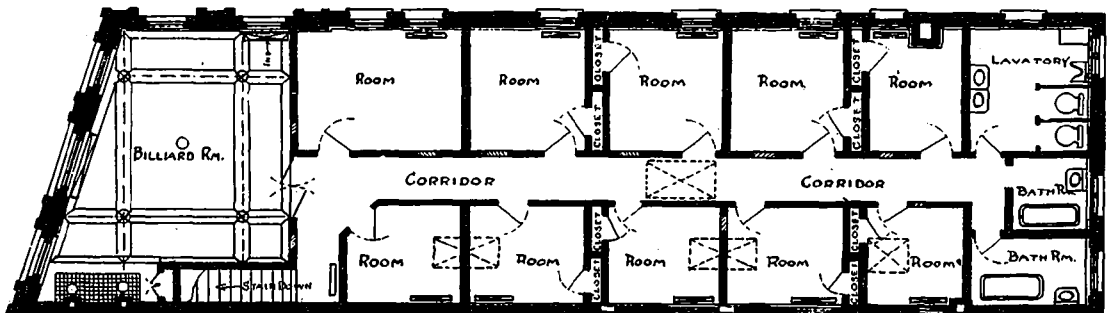
School boards invariably invite plans for a building much better than the one they usually erect, owing to the fact that the cost of the building originally intended is in excess of the sum they care to expend. When they find that it is an utter impossibility for the architect to squeeze a building of certain required dimensions, provided with every possible safeguard, into an inadequate sum, then the process of paring down comes, and it usually results in the sacrifice of many of the vital points of a structure and in the erection of a building only as good as the money on hand will allow. Hence the architect is to blame, not because he wasn't capable of designing a structure embodying every element of safety, but because he wasn't equal to the task of making the school board's appropriation more elastic, and, therefore, made it necessary for the building committee to accept a cheaper and less safe structure. It is this lack of sufficient reasoning and investigation that has too often subjected the architect to many opprobrious attacks, and makes him the scape-goat for the negligence and shortcomings of others. It is just such criticisms fired at random that make him a much maligned person, and it would be well if the writer in question, and others who have unwittingly offended in the same way, would refrain from endeavoring to fix the blame until they can do so with some degree of positive knowledge.



MAIN BANKING ROOM, SHOWING A DEVIATION FROM CONVENTIONAL HEAVY GRATING AND GRILL WORK IN BANK FIXTURES, BANK OF BRITISH NORTH AMERICA, WEST TORONTO. ELLIS & CONNERY, ARCHITECTS.



GROUND FLOOR PLAN, SHOWING THE MANNER IN WHICH ALL SPACE HAS BEEN ECONOMICALLY UTILIZED, BANK OF BRITISH NORTH AMERICA, WEST TORONTO. ELLIS & CONNERY, ARCHITECTS.



SECOND FLOOR PLAN, SHOWING THE ROOMS PROVIDED FOR THE CLERKS, BANK OF BRITISH NORTH AMERICA, WEST TORONTO. ELLIS & CONNERY, ARCHITECTS.

A BRANCH BANK BUILDING---Structure Recently Erected at West Toronto.---Architectural Treatment Simple, Yet Rich.---New Arrangement of Banking Room.---Provides Living Quarters for Clerks.

CANADA has nearly one thousand branch banks that are scattered over the Dominion in every city, town and hamlet. There is no country of its size that has as many branch banks, nor whose chartered banks individually have so many branches.

This is a condition that arises from two causes: the first, our banking system, and the second, the rapid growth of the country, and the springing up of thriving towns and villages all over the western country, in which well established, safe banking institutions not only play an important part, but become an absolute necessity in the development that conditions render inevitable.

The unprecedented wave of prosperity that has swept over the country during the past five years has brought about the establishment of many branch banks, and with the growth of the business carried on through the branches has come the erection of many structures for the housing of the local banks.

The directorate of the various banks have realized the importance of a dignified, solid class of bank building that would serve architecturally and constructively as a standard which the local merchants could well afford to recognize in the erection of the structure for the housing of his business. As a result the branch bank buildings recently erected, while not necessarily large, have all been of the better class of construction. Some being more monumental or ornate in design than others; some being planned more along profit-producing lines, and some being designed solely and entirely to serve as monuments to the bank, in which provision is made for the conducting of their local business.

Illustrated herewith is what may be considered as a good type of building used for this purpose. It is the branch institution of the Bank of British North America at West Toronto, and gives an excellent idea of what has been accomplished along this line.

While not of the monumental type it is, nevertheless, not by any means lacking in architectural expression or wanting in solidity of construction. It represents a building in which no legitimate expense has been spared and in which useless ornamentation has been studiously avoided. Throughout the structure is modernly equipped and all space has been economically utilized. The different rooms are conveniently arranged and every comfort and convenience has been provided for both the staff and public.

In exterior design the building is classic, and it is

constructed of Ohio sandstone and pressed brick. The facade is symmetrical in outline and the general treatment is such as to give it a dignified and somewhat massive appearance. There is just sufficient detail to agreeably relieve the preponderance of straight lines and render the whole decidedly striking and pleasing. Immediately over the main entrance, beautifully wrought in carved stone is the bank's crest and coat of arms, while below the cornice in stone letters stands the name of the bank in bold relief. In the centre of the balustrade coping, surmounting the cornice and continuing with the stone work down the lane, is another tablet, which gives the date on which the institution was founded.

On either side of the entrance are specially designed bronze lanterns, which, apart from serving as an embellishment, are lighted at night to illuminate the building and street and dispel the gloom that has been so noticeable in the neighborhood of places of this kind after dark.

Access to the banking room is through the circular vestibule, having mahogany panelled walls and ceiling,

and a short corridor finished in a similar manner, with the exception of the ceiling, which is vaulted. It is in this department that one is impressed with the rich yet unlavish character of the room. The absence of high domed walls, large domed ceiling and massive column marks a new departure in bank building construction. This change is further accentuated by another deviation from the conventional bank office, in the absence of heavy gratings and grill work, which is used so extensively in such places for enclosing the bank room proper to separate it from the public space.

Instead, one finds a richly finished mahogany counter, which approaches from the wall, curves gracefully and extends the full length of the room. On the inner edge of the top of this wide counter is the only screen between clerks and public. It is of bevelled plate glass, twelve inches high, with gunmetal base and cap, having each department indicated by sand-cut signs in the clear plate glass. In this manner the clerks and the public are placed in direct communication. There is nothing in the fixture or arrangement to suggest public distance. The general aspect is one of openness and hospitality.

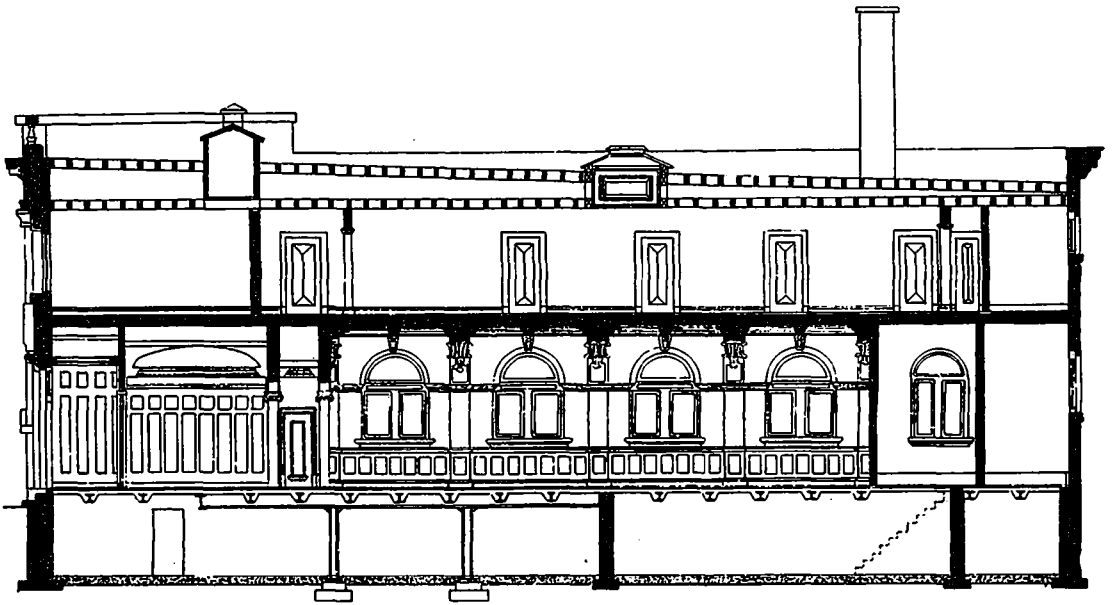
The different departments are separated by artistic gunmetal screens which tend to enhance the general tone of the place. The walls above the dado, which is finished in highly polished mahogany to correspond with the counter, and agreeably set off with a marble base



BRANCH BANK BUILDING, BANK OF BRITISH NORTH AMERICA, WEST TORONTO
ELLIS & CONNERY, ARCHITECTS.



MAIN BANKING ROOM, LOOKING TOWARDS ENTRANCE, BANK OF BRITISH NORTH AMERICA, WEST TORONTO.
ELLIS & CONNERY, ARCHITECTS.



SECTIONAL ELEVATION, BANK OF BRITISH NORTH AMERICA, WEST TORONTO. ELLIS & CONNERY, ARCHITECTS.

which extends around the entire room and continues through the corridor, are in stucco with pilasters surmounted by beautiful composite capitals. The ceiling is heavily beamed, having enriched cornices, and from the centre of the panels are suspended lighting fixtures, which have been selected with discriminating taste and which adapt themselves readily to the entire scheme. The floor of this room is of Terrazo, with a mosaic border, while those of the vestibule and corridor are of the Terrazo only. Cheque desks, a settee and several comfortable chairs are judiciously placed for the accommodation of the public.

The ladies' writing room, which is situated to the right of the corridor on entering the building, opens off the public space of the banking room, as does the manager's office, which is located on the left side of the entrance. Both of these rooms present an inviting appearance, and the wood-work throughout, like that of the banking room, corridor and vestibule, is of crotch mahogany. The ladies' room, which is 8 x 10½ feet in floor area, is furnished with a nice Turkish rug, desk, table and ample chairs. The walls are panelled and the ceiling is vaulted. An artistically designed stained glass window borrows light from the plate glass windows of the stair hallway, located immediately to the north at the front of the building.

In the manager's office the same select taste has been displayed as is shown in the other rooms. This room is elongated in shape and measures in floor dimensions 9½ x 20 feet. The walls are dadoed to the height of eight feet and finished above this point in stucco, the angle of the walls and domed ceiling being connected with a bracketed and dented stucco cornice. A large fireplace, of Roman brick with mahogany mantel and trimmings, stands in one corner of the room.

Adjoining the vault, on the left, is stationery room, 9 x 12 feet, through which the tiled lavatory provided for the staff and manager is reached. Near the door, opening into the vault, a drinking fountain for the staff has been installed.

Situated off the entrance corridor is the stair hall, leading to the second storey, which is arranged as a home

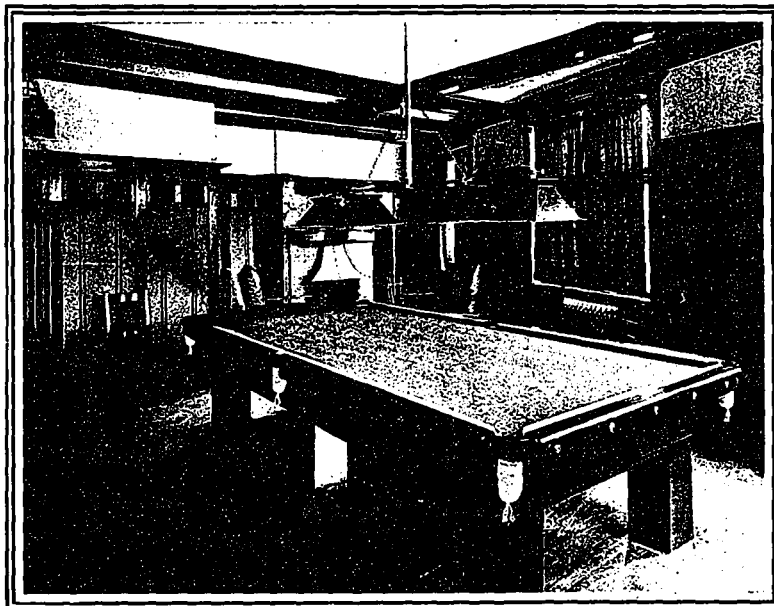


MANAGER'S OFFICE, BANK OF BRITISH NORTH AMERICA, WEST TORONTO. ELLIS & CONNERY, ARCHITECTS.

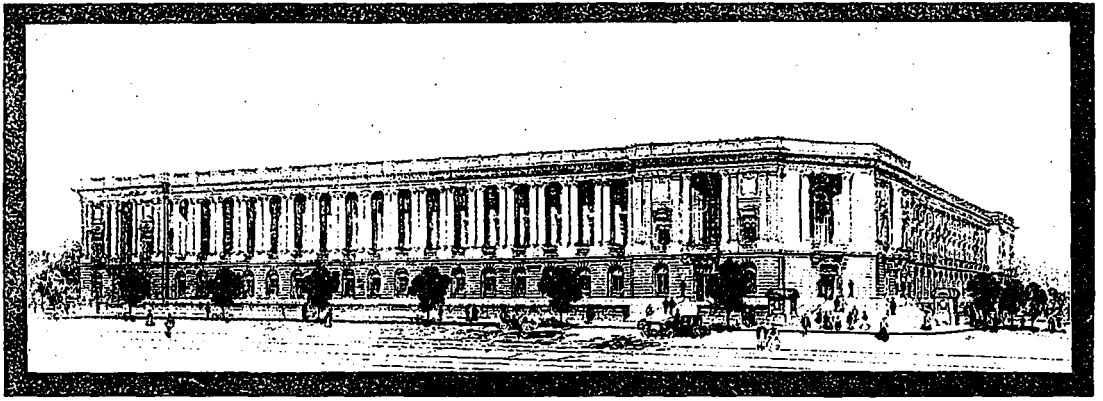
for the employees. As in a great number of cases bank clerks are from other parts than the community in which the bank is located, the directorate decided that this portion of the building could be more advantageously and profitably employed in providing suitable quarters for the members of its staff, than for office purposes. In carrying out this idea in this respect nothing has been spared to embody every convenience and facility known in domestic art.

At the head of the staircase, which is located at the front of the building, is a large billiard room, 18 x 25 feet, having a large fireplace in one end. Immediately at the rear of this room is a den, 12 x 16 feet, and running on either side of the hall are the bedrooms, which are inviting in character and provided with built-in closet. In all there are eight of these rooms, and their average size in floor space is 11 x 12 feet.

The rear of this floor is fitted up with two bathrooms and a large lavatory, having tile floors and walls, marble divisions and plated railings. The plumbing is along the most modern lines, and the sanitation throughout is the best procurable. All the basins and tubs are of porcelain and enamelled iron and the plumbing fixtures are nickel-plated.



BILLIARD HALL, BANK OF BRITISH NORTH AMERICA, WEST TORONTO. ELLIS & CONNERY, ARCHITECTS.



EXTERIOR VIEW, OFFICE BUILDING, U.S. HOUSE OF REPRESENTATIVES, WASHINGTON, D.C. THOMAS HASTINGS, CONSULTING ARCHITECT.

OFFICE BUILDING FOR LEGISLATORS---New Quarters for Members of the House of Representatives at Washington, D.C.---Structure Provided with Every Device Known to Building Science.

WITH the growth of every country comes the erection of new government buildings, the adoption of more adequate means to facilitate the transaction of business of the various departments and the providing of better accommodation for those upon whom devolves the work that is so vital to the welfare of the people.

Canada has not only kept abreast of the times in this respect, as is witnessed by the proposed Justice and Departmental buildings at Ottawa, the Saskatchewan and Alberta Legislative and Executive buildings, the new Government warehouse at Winnipeg, the court house at Moose Jaw, etc., but the character and architecture of her buildings are such as to highly commend themselves to all those who admire permanence and symmetry in structures representative of this particular class of building.

In each instance, the foresight and wisdom that has been manifested in the selection of sites and the provisions that have been made for future extensions, shows plainly that Canada has by no means reached her limit in improvements of this nature and that a careful eye has been turned to the additions which will be necessary from time to time to provide for the expansion of the governmental departments.

Not unlike the United States, Canada will in all probability be called upon some day to furnish a building that will be used exclusively as office quarters for her legislators. A building that will enable them to draft their bills, compile their statistics and prepare their arguments, or receive members of their constituency, with a certain amount of privacy, and without the necessity of converting their residence or hotel into a place for affairs of this kind, or transacting their business in a more or less public manner in the legislative halls.

This problem of providing a modern building for the people's representatives has been admirably worked out in the Office Building of the House of Representatives at Washington, D.C., which was recently erected at a cost of over \$3,000,000. The structure is not only highly interesting as an innovation in government building construction, but has many noteworthy features in its architectural treatment and plan and equipment.

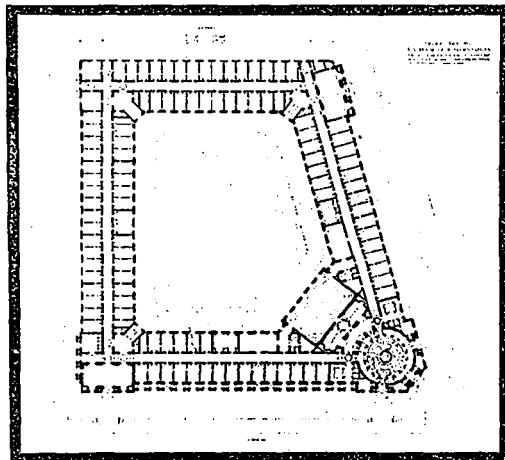
The building architecturally is a beautiful example of the modernized monumental type, and the plan has been very carefully worked out to adequately provide for every requirement conceivable in a structure to be used for the purpose for which it was built. In the matter of equipment it is the most modern government building in the world, and every detail has been studiously considered to take advantage of every appliance known to modern building science. If for no other reason than the feature last named, this building presents a most interesting study.

The building is located on Square 690, immediately southeast of the Capitol Building. The square is bounded by B street, New Jersey avenue, First street and C street southeast, and the building occupies the entire square, with the following frontages: 476 ft. 2 in. on B street, 470 ft. 1 in. on New Jersey avenue, 452 ft. 6 in. on First street, and 348 ft. 9 in. on C street. These make a total frontage of 1747 ft. 6 in., or, approximately, one-third mile.

The B street and New Jersey avenue fronts have been set back from the curb 55 ft. 3 in., and the space between the sidewalk and the building

will be devoted to terraces, to give the structure an adequate architectural setting.

The building is planned in the form of a hollow square, the open part in the centre being a court nearly 300 feet in diameter. In conformity with the design of the Capitol Building, the principal (B street) front of the House



GENERAL FLOOR PLAN, OFFICE BUILDING, U.S. HOUSE OF REPRESENTATIVES, WASHINGTON, D.C. THOMAS HASTINGS, CONSULTING ARCHITECT.

Office Building shows three stories above ground, but the grade falls away so rapidly on New Jersey avenue and First street that the rear (C street) front is five stories above ground, the lowest story being the sub-basement on a level with the street and court. This has made it possible to arrange ample driveway entrances in the centre of the C street wing, on the level by which access is gained to the court. These driveway entrances open on large rooms which will be used for handling incoming and outgoing mail, as well as supplies, etc., required for the building. Supplies for the Capitol can also be brought in this C street entrance, trucked through the sub-basement corridors to the corner of B street and New Jersey avenue, and from thence through the subway to the Capitol. The construction of the subway has made possible the removal of the sidewalk lifts which were necessary but not sightly features of the east approach to the Capitol. A driveway, starting at the C street entrance, will encircle the court, and will give access to the building at each of the corners of the court, where doorways have been provided leading directly to the staircases and elevators.

The exterior of the building is classic in design. It suggests in its general division of the parts the Garde Meuble on the Place de la Concorde, Paris, while the pavilions are modelled on those of the Colonnade du Louvre. Architecturally the front is divided into two parts, the lower story, constituting a "rusticated" base on which, extending through the upper stories, is the colonnade, surmounted by its entablature and balustrade.

The colonnade on B street, between the two flanking pavilions, is 292 feet 7 1-2 inches long, and is made up of 17 "bays," with 16 pairs of Doric columns and with a single column at each end, making 34 columns in all. Elsewhere, on the pavilions, there are 18 additional columns, a total of 52. Each column is 29 feet high, 3 feet 5 inches in diameter and rests on a base or pedestal, 3 feet high.

On New Jersey avenue there is no colonnade, as on B street, but the colonnade is "recalled" by employing pilasters. The C street and First street facades are without columns or pilasters, except at the extreme north end of First street, where there is a short colonnade of eight columns. The court facades are also without columns or pilasters.

When the Senate office Building is completed it will be seen that the two office buildings and the Capitol Building make one composition. In designing the two office

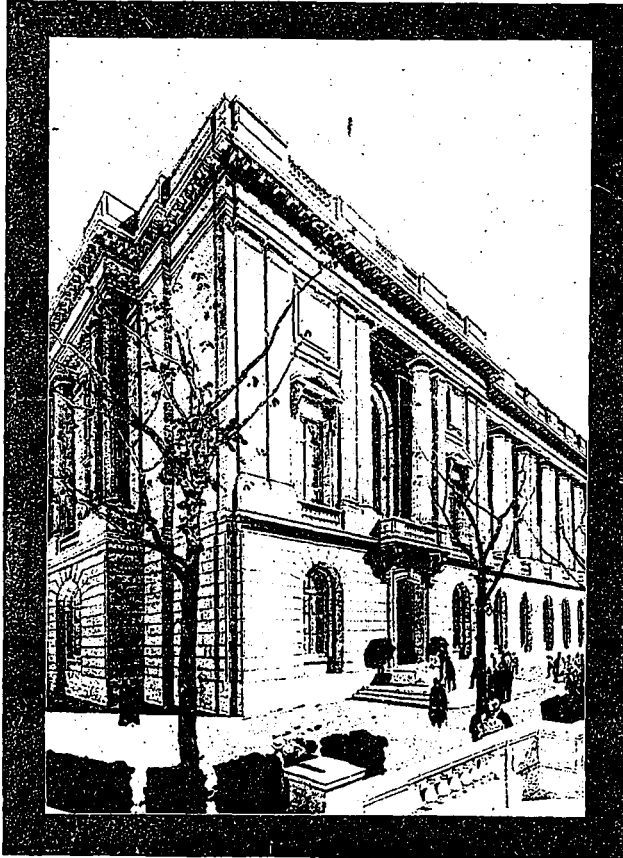
buildings this object has been constantly kept in mind. The two fronts of each building as seen from the Capitol Plaza are identical in size and design. The height of the buildings has been restricted that they may not overpower the Capitol, and they have been kept simple in design, without pediments, domes or other accentuated points of architectural interest, any of which, it was felt, would detract from the effect of the Capitol Building. This does not mean that the office buildings are uninteresting by any means. The long colonnade is impressive and the pavilions are full of interest, while anyone who studies the buildings at close range will find sufficient ornament and other detail, judiciously placed so as to heighten the general effect.

The long unbroken cornice lines of the office buildings, leading up naturally to the Capitol Building, and from thence to the great dome, the crowning and dominating unit in the group, will all conduce to the desired effect of making the Capitol Building still more imposing and effective.

The offices on each floor are arranged in a double row, separated by a corridor 12 feet wide. The outer rows of offices face the four streets while the inner rows open on the court. Four stories are devoted to offices, the first, second, third and fourth. The sub-basement, or cellar, is given up to storage and other purposes connected with the administration and operation of the building.

The offices average 23 1/2 feet deep and 16 feet wide, and there are 397 of them. The present membership of the House, 60th Congress, is 396 (members and delegates), so that there is an office for each member.

In addition to the office rooms, 14 large rooms have been set aside for the possible use of committees, which may be moved



CORNER VIEW, OFFICE BUILDING, U. S. HOUSE OF REPRESENTATIVES, WASHINGTON, D. C. THOMAS HASTINGS, CONSULTING ARCHITECT.

to the new building from the Capitol.

Each office room is floored with cement, laid off in squares, the walls are finished in buff plaster, "sand finish," and the cornice and ceiling in smooth white plaster. The wood finish consists of a baseboard and near the ceiling a picture moulding, with architraves around the doors. There is no wood finish around the windows, the plaster being turned in against the window frame. The woodwork is painted white and the doors are mostly of mahogany.

At the corridor end of each room are two flues, one each side the doorway, enclosed in terra cotta. One of these is a heat flue, by means of which the office room is supplied with tempered fresh air through a register



VIEW OF ROTUNDA SHOWING THE MASSIVE SUPPORTING COLUMNS AND DETAIL OF RICHLY PANELLED CEILING. OFFICE BUILDING, U.S. HOUSE OF REPRESENTATIVES, WASHINGTON, D.C. THOMAS HASTINGS, CONSULTING ARCHITECT.

near the ceiling. The room is ventilated by drawing out the air through a register in the other flue, placed near the floor and concealed under a lavatory. One flue being near the ceiling and the other near the floor will cause a constant circulation of the air which enters the room through the heat flue. To avoid drafts, the system has been so designed and the sizes of the flues so proportioned that a very large quantity of moderately heated air can be introduced at a very slow rate, thus reversing the usual method of delivering to the room a minimum quantity of burned up air at a very high velocity. To overcome the tendency of the large expanse of glass in the window of each room to lower the temperature and thus create drafts, there has been provided a steam radiator in each window recess. These radiators being regulated independently of each other, it is possible for the occupant of any one room to control the temperature of that room in accordance with his own preferences.

The lavatory with which each floor is equipped is placed against the ventilation flue at the corridor end of the room, all supply and waste piping being run inside the flue. These lavatories are supplied with hot and cold water, and, through a separate fixture, with ice water.

Against the heat flue is placed the telephone, as well as the outlet to which will ultimately be connected the call bell system. This system will ring a bell in each office room, coincident with the ringing of the "legislative bell" in the Capitol building.

All electric wires run in the heat flue. Both the heat and vent flues are accessible from the attic, so that repairs and alterations to wiring and piping can be made without disturbing the plastering or other finish in any of the rooms.

Each room is lighted with a bracket light over the lavatory, another over the telephone, and two chandeliers. In addition, there are six outlets covered by nickel plated brass plates, in the baseboard. Into these outlets plugs, carrying electric wires, can be inserted. This system will enable the occupant of a room to have a desk light, no matter where he places his desk. It results, also, in freeing the walls of brackets, which could not be located just where they would suit the varying requirements of the occupants of the different rooms, and which would also interfere with the placing of the necessary book-cases and filing cabinets against the walls.

The wiring of the rooms for lighting has been very carefully planned. The ceiling lights, the brackets on the end walls and the baseboard outlets in any one room are on four different "circuits." This means no one room can be plunged in darkness unless all four circuits "burn out" at the same time. This would be such an extraordinary coincidence that it may be said that it is impossible for any one room to be deprived of light, short of a breakdown in the power plant. As all the apparatus in the latter will be in duplicate, it would be necessary for the entire plant to go to pieces before the office build-

ing could be put out of commission in this respect.

Each office will have an electric clock over the doorway at the corridor end of the room. All the office clocks will be connected together electrically and will be operated by a master clock, under the care of the custodian of the building. By this system the time in each office will be correct, within a variation, per month, of not more than four seconds. This electric clock installation will be one of the largest ever attempted.

Three places of interest in the building which will be somewhat elaborate architecturally are the rotunda, the main stair and the conferenc room back of the latter.

The rotunda is at the corner of B street and New Jersey avenue, and is entered directly from above the street as a sort of large vestibule, from which radiate on either side the B street and New Jersey avenue corridors. Between the radiating lines of the corridors will be seen the main stair, and, back of this, the entrance to the conference room.

Architecturally, the rotunda consists of a circle of 18 marble columns standing on a circular marble arcade, all enclosed in a circular wall, or shell. On the centre line of the columns, the rotunda has a diameter of 57 feet, 4 inches, while the diameter of the encircling wall is 75 feet, 6 inches.

The height of the rotunda from the first floor to the crown, or "eye," of the panelled dome is 68 feet.

Immediately back of the rotunda is a circular corridor, connecting the B street and the New Jersey avenue corridors, and back of this is the main stair. This stair is really double; that is, it consists of two staircases facing each other, and connected by a landing or passage by means of which the conference room is reached. The stair is what is known as an "intramural stair," that is, between walls; after the manner of the monumental staircases of the Italian Renaissance.

The conference room back of the main stair is on the third office floor of the building and is 86 feet long, by 54 feet wide. This room overlooks the court of the building on which its five large windows open. It is designed to be used for public hearings before committees of the House, whenever such hearings are largely attended.

This room is directly accessible to the public by means of the "intramural stair" and by public elevators, while for members of the House there are private stairs and elevators. These latter connect with the cloak rooms and smoking rooms adjoining the conference room.

On the floor below the conference room, there is space available for a post office with accommodation for telegraph office and a public telephone station. Below

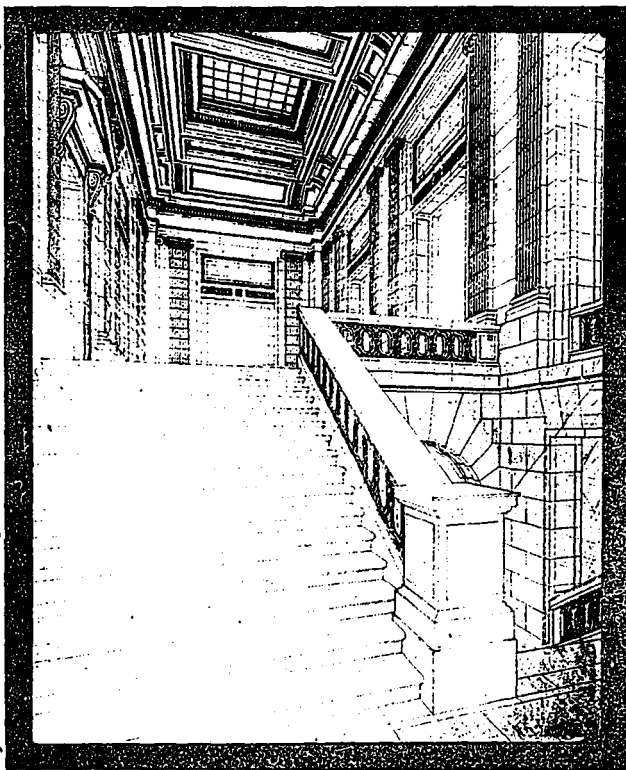
that will be the barber shop for use of members. On the second office floor, at the southwest corner of the building space has been set aside for a dining room with its serving room, while around the corner, on C street, a cafe may be provided. The kitchen will be in the basement. The dining room will seat 150 persons and the cafe 100 more.

In addition to the entrances at New Jersey avenue and B street already alluded to, there is an entrance on the street level at First and B streets, near the Library of Congress. There are other entrances, on the first floor level, at New Jersey avenue and C street and at First and C streets. In addition to these there are entrances on the court at the level of the street.

Because of the unusual dimensions of the building, it was necessary to devote considerable study to the disposition of elevators and staircases, in order that these

might be arranged so as to provide ample facilities. With this end in view, there have been distributed through the building eight staircases and twelve elevators which, it is thought, will meet all the demands both of the members of the House and such of the public as have occasion to visit the building. The staircases are so arranged that the windows which light them will assist in lighting the long corridors which separate the rows of offices.

The building is of old fashioned masonry construction, as distinguished from the "skeleton" type now usually employed in the construction of office buildings and "skyscrapers." The walls are faced with stone, "backed up" with brick, and the floors are carried on steel beams resting on the stonefaced exterior, and the solid brick interior walls. Between the beams is the floor construction of



DETAIL OF INTRA-MURAL STAIRCASE AND CORRIDOR AT LANDING, OFFICE BUILDING, U.S. HOUSE OF REPRESENTATIVES, WASHINGTON, D.C. THOMAS HASTINGS, CONSULTING ARCHITECT.

reinforced concrete. The B street and New Jersey avenue fronts are faced with South Dover, N. Y. marble, the C street and First street fronts are faced with Georgia marble, the court fronts with Bedford limestone, on a basecourse of granite. This is the largest single cut-stone contract ever executed in the United States, and called for the furnishing and setting of between 285,000 and 290,000 cubic feet of stone. The amount of the contract was over \$1,100,000.

In addition to the office and committee rooms the building contains accommodations for the following: A conference room with cloak and lounging rooms adjoining; a dining room, lunch room, pantries and kitchen; a post office room with space for public telephone booths and telegraph office; barber shop and bathing room, and in the cellar the necessary storage rooms. The latter can be reached through three driveway entrances on C street,

and at the corner of B street and N. J. avenue connect through the new subway with the Capitol.

Dates connected with the construction of the building: Demolition of old buildings on the site commenced Feb. 1, 1904; general excavation of site commenced, July 18, 1904; concrete work in foundations commenced, April 12, 1905; first brick laid, July 5, 1905; first stone set, August 24, 1905; concrete foundations completed November 29, 1905; corner stone laid April 14, 1906; last stone on exterior set November 9, 1907.

James G. Courts, Secretary to the Commission; Elliott Woods, Superintendent, U. S. Capitol Building and Grounds, Superintendent of Construction; Thomas Hastings, New York, consulting architect.

Consulting services, special investigations, reports on materials and devices proposed for use in the building, and similar services were rendered by the following: Owen Brainard, consulting engineer, New York; Theodore Cooper, consulting engineer, New York; Charles Soosmith, consulting engineer, New York; Swinburne & Clark, consulting sanitary engineers, New York; John Stephen Sewell, Captain of Engineers, U. S. A.; Arthur A. Ernst, consulting illuminating engineer, New York.

F. L. Averill, Washington, D.C., structural engineering work; Prof. S. Homer Woodbridge, Boston, heating, ventilating and sanitary engineering work.

S. S. Hunt, assistant to the superintendent and constructor in charge; C. P. Glem, chief electrical engineer, U. S. Capitol Building, in charge of electrical installation; Oscar Wenderoth, head draughtsman, House and Senate Office Buildings, in charge of drafting room.

The Government furnished the brick, cement and sand required in backing up the stonework and in constructing the interior walls and contracted for the labor of laying the brick.

The construction of the House Office Building is under the personal supervision of the Superintendent of the Capitol Building and grounds. All drawings required in the construction of the building were made in a drafting room near the site of the work, subject to the criticism of the consulting architect, Mr. Thomas Hastings, of the firm of Carrere & Hastings, New York.

The following data relates to the construction of the building:

Appropriation for construction of building, \$3,100,000; appropriation for purchase of site, \$750,000; total area of building, 110,500 sq. ft.; cubic contents, 8,800,000 cu. ft.; rooms available for offices and committees, 410; (The above count does not include rooms devoted to special uses, such as post office, dining-room, etc.) general excavation of site, 125,000 cu. yds.; cut stonework between 285,000 and 290,000 cu. ft.; bricks in walls, 16,150,000; cement used, 71,507 bbls.; copper used on roof, 142,044 sq. ft.; terra cotta blocks used in partitions, 241,200 sq. ft.; plaster cornice in corridors, 3 1/2 miles; plaster cornice in office rooms, 6 miles; plain plastering in offices, 65,774 sq. yds.; plain plastering in corridors, 24,711 sq. yds.; staircases, 8; elevators, 12; mail chutes, gravity conveyors, 5 of each; entrances, 14; windows, 730; interior doors, 816; electric conduits, 155,000 lin. ft., or 30 miles; electric wire run in above conduits, 241,000 lin. ft., or 40 1/2 miles; lighting receptacles in baseboards, 3,500; push button switches, 1,300; electric clock outlets, 450; electric lamps required, 10,000 (equivalent in 16 candle power lamps to 16,000); radiators in rooms and halls, 560; heating pipe, total, 43,000 lin. ft., or 8 miles; public toilet rooms, 32; toilet room lavatories, 144; urinals, 134; water closets, 212; soap sinks, 35; drinking fountains in toilet rooms, 27; combined lavatories and drinking fountains in office rooms, 417.

A BRANCH BANK BUILDING.---Structure Recently Erected at West Toronto.---Architectural Treatment Simple, Yet Rich.---New Arrangement of Bank Room.---Provides Living Quarters for Clerks.

(Continued from Page 31)

The second floor throughout, with the exception of bath-rooms and lavatory, is finished in quartered sawed white oak. The decorative scheme of the interior shows taste and discrimination, and is, to say the least, most pleasing to the eye.

The conduit system of electric wiring has been adopted throughout the building, and all the lighting fixtures were specially designed for the various rooms. For heating the building the single pipe low pressure steam system has been installed, as has also a complete ventilating system.

The building was designed by Messrs. Ellis & Connery, Toronto, who also carried out the details and superintended the erection of the structure. The building is a two storey structure, 30 x 90 feet, and the pressed brick used in its construction was furnished by the Milton Pressed Brick Co.

The several branches of the work were executed by the following contractors: Mason and brick work, H. Neihman; cut stone work, John Vokes; plastering, T. Gander & Son; carpenter and joiner's work, Smith & McElroy; painting and glazing, James Taylor; art glass, The R. McCausland Co., Limited; plumbing, Robert Paterson; electric wiring, The Bennett Wright Co.; electric fixtures, McDonald & Willson; decorating, W. H. Elliott & Sons Co.; roofing, Sheet Metal Works (D. W. Hall); structural steel work, McGregor, McIntyre & Co.; tile work and terrazo, H. M. Robinson Co.; hardware, The Vokes Hardware Co.; vault, doors and safe, The J. & J. Taylor Co.; bank fittings, The Toronto-Waterloo Office Fixture Co.; billiard table and supplies, Samuel May Co.; furniture, rugs, grates, etc., The T. Eaton Co.

RE-INFORCED CONCRETE APPROVED.---British Architects Favor New Construction.

REINFORCED CONCRETE for buildings recently received a most favorable commendation from the Royal Institute of British Architects. Last summer the British Office of Works requested the Institute to express an opinion concerning the durability of reinforced concrete buildings, for at that time the Local Government Board was contemplating making certain discriminations against this material as compared with brickwork. In its answer, the Science Standing Committee of the Institute stated that works in reinforced concrete which comply with the requirements outlined in the report of the committee printed in The Engineering Record of Aug. 3, 1907, are at least as durable as brick or stone buildings. The committee stated that any action which would limit the period of loans for reinforced concrete work to less than the period for brickwork would be a mistake, resulting in Great Britain being largely debarred from the advantages of modern and more economic methods of construction employed, not only by foreign countries, but by bodies not requiring the consent of the local Government Board to their undertakings. The committee further pointed out that after the great chain tie which binds the base of the dome of St. Paul's Cathedral had been in place for more than 200 years, it was examined and found perfectly bright, owing to its protection by the concrete in which it had been embedded. It is further pointed out that in 1886 the city of Grenoble constructed some reinforced water pipes which were in service for 15 years without any cracks appearing. They were then examined and the metal of the reinforcement was found to be entirely free for rust although the pipes had been under a head of many feet. The results of these examinations and other information of the same nature convinced the committee that reinforced concrete, when properly made, is a thoroughly reliable material.



A JOURNAL FOR THE BUILDING AND
ENGINEERING INTERESTS OF CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Saturday Night Building
TORONTO CANADA

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Address all correspondence to "CONSTRUCTION," Saturday Night
Building, Toronto, Canada.

Telephone { Private Branch Exchange connects with all Departments } Main 6640
Main 6641

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SUBSCRIPTIONS.—Canada and Great Britain, \$2.00 per annum. United States, the Continent and all Postal Union Countries \$3.00 per annum in advance.

ADVERTISEMENTS.—Changes of, or new, advertisements must reach the Head Office not later than the first of each month to ensure insertion. Advertising rates on application.

CORRESPONDENCE.—The Editor will be pleased to receive communications upon subjects of interest to the readers of this journal.

Vol. 1 May, 1908 No. 7

Current Topics

OTTAWA IS TO HAVE a new civic asphalt plant. The steel work of the structure is well under way, and it is expected that the plant will be ready for operation in the very near future.

* * *

THE NEW STEEL BRIDGE at Medicine Hat, has been opened to traffic. This structure spans the South Saskatchewan river and is the largest bridge in the province of Alberta. It consists of five 200-foot spans, with two 50-foot approaches, and costs \$250,000.

* * *

WORK HAS BEEN COMMENCED on the new subway which is to extend under the C. P. R. tracks at First street, west, Calgary. This undertaking has been made necessary in order to minimize the danger at that crossing and to facilitate the growing traffic of the city.

* * *

GENERAL CONFIDENCE as to the building outlook for the coming season, was expressed at the annual meeting of the Toronto Chapter of the Ontario Association of Architects, held April 7. The election of officers for the present year, resulted as follows: Chairman, George W. Gouinlock; secretary, H. Sparling; treasurer, P. G. Wickson; auditor, H. B. Gordon.

* * *

AT THE ANNUAL MEETING of the Regina Architectural Association held on Wednesday, April 1, 1908, the following officers were elected for the ensuing year: President, F. Chapman Clemesha; vice-president, E. M. Storey; secretary-treasurer, W. B. Van Egmond; committee, W. W. Hilton, Geo. E. Hutchinson, Walter J. Colman.

A SITE HAS BEEN SURVEYED for the proposed bridge to be built over the Pembina river, Alberta, on the line of the G. T. P. The new structure will be the highest on the Grand Trunk system, measuring 900 feet in length and 220 feet high. It will rest on two steel towers supported by piers.

* * *

TORONTO'S BIGGEST DAY in applications for building permits was recorded in the past month, when sixty plans were submitted for the inspection of the City Architect. The best record in previous years was forty plans in any one day, and there is every evidence that the city will see a brisk year in the erection of new buildings.

* * *

ACCORDING TO RECENT ESTIMATES received by the Department of Land, Forests and Mines, the pine cut in Ontario during the past year amounted to 675,000,000 feet. These estimates show a reduction of 35,000,000 feet, or about 5 per cent., from estimates submitted earlier in the season, which gave the total as 710,000,000 feet.

* * *

IF THE FIRST FIVE DAYS OF APRIL can be regarded as a criterion for the building operations to be carried on at Vancouver this year, that city is certainly on a rampage of prosperity. During that period the total amount for permits issued was \$15,000 in excess of the sum expended on new structures for the entire month of April, 1907.

* * *

MONASTERIES WERE THE HOTELS of mediaeval times. History is repeating itself in Paris. The Oblate Monastery, in the Rue Saint Petersburg, is being transformed into a modern hotel. Much of the quaint architectural features are being retained. One of the chapels will serve as a dining-room, the monks' refectory will be a reading-room and the large garden will be employed for open air meals in summer.

* * *

GYPSUM HAS BEEN LOCATED within sixty miles of Vancouver and a plant capable of handling fifty tons a day will be erected on the waterfront. A company is being formed in the above city to take over the property which will be placed under the management of J. W. Prescott. The deposit discovered is free from silica, making it very easy to treat. The ledge is 22 feet in width and the first traces of the mineral were found in one of the two creeks passing through the claim.

* * *

ACCORDING TO THE FIGURES of the Labor Department, the total number of labor organizations formed in Canada during 1907 was 232, and of organizations dissolved 38, being a net increase during the year of 174. Compared with the three preceding years, the returns show a marked increase in the activity of the organization. In 1906 the number of organizations formed was 154, and of organizations dissolved, 85, a gain of only 69. In 1905 there was a net loss of two, the unions formed numbering 103, and unions dissolved, 105. There was an increase of 44 in the number of unions during 1904. The year 1902 alone, since records have been kept by the department, was more active than the season just past in regard to the organization of workmen, the number of unions formed in that year being 275 and of unions dissolved 54, a net increase of 221. Of the organizations formed last year, 51 were formed by railway employees, 43 by metal workers, and 41 in the building trade. Ninety-four organizations were formed in Ontario, 51 in Quebec, 28 in Alberta, and 22 in British Columbia.

FOUR MORE STOREYS are to be added to the tower of the Metropolitan Life Insurance Company's building, New York. These will make the tower an even 700 feet above the level of the street. As originally planned by N. Lebrun & Sons, the tower was to be 658 feet high and have forty-eight storeys. The Singer tower is 612 feet above the street level. The additional four floors will make the building a fifty-two storey structure, the tallest building in the world.

* * *

APPLICATION FOR A CHARTER has been filed at Ottawa by the Northern Empire Railway Company, with head offices at Calgary. The company, which will have a capital stock to begin with of \$10,000,000 proposes to build a line two thousand miles long from the International boundary east of Cardstone, Sask., northeasterly through Lethbridge to Fort Vermilion, and thence through British Columbia and Yukon Territory, via Dawson City to the Alaskan boundary; also a branch line from a point on the main line east to Victoria, along the north bank of the Saskatchewan river to Edmonton.

* * *

RETURNS TO THE UNITED STATES Geological Survey, representing 95 per cent of the Portland cement production of the United States for the year 1907 indicate that the total output of Portland cement in the last calendar year was approximately 48,000,000 bbls., as compared with 46,463,424 barrels in 1906 and 35,258,812 barrels in 1905. The increase in production in 1907 over 1906 was below the average of previous annual gains, which is said to have been the result of general business depression in the latter part of the year.

* * *

IN A RECENT COMMUNICATION to the Department of Trade and Commerce, Ottawa, Trade Commissioner Alex. McLean, located at Yokohama, Japan, states that a native of that country is reported to have invented and patented a new type of tile made from paper board. The new tile is the result of several years' experimenting on the part of a manufacturer of pasteboard boxes, with a view of utilizing the waste material of his factory. It is said to be ideal for roofing purposes, being proof against rain and fire and much lighter than common earthen tile. The new product will, it is stated, so reduce the work and cost of roofing that it will give a cheaper and better roof at from 30 to 50 per cent. less price.

* * *

SOME STARTLING FACTS regarding the deplorable state of the schools of St. John, N. B., has been brought to light by the committee appointed by the City Council to investigate the condition of public buildings in the matter of fire protection. According to the committee's report there is not a properly planned and constructed fire escape on any of the school buildings and that those now attached to some of the schools are a delusion and a snare utterly unsafe and unfitted for the purpose for which they are intended. Other defects enumerated are in reference to heating pipes being placed near the woodwork, doors opening inward, and improper methods of sanitation and ventilation. The Bentley street school is declared to be unfit for the purpose for which it is being used, and the condition of the high school is such that it was imperative for the committee to recommend the removal of the chemical laboratory from the building. Judging from the report rendered, St. John is sorely in need of a more substantial and safer class of structure for school purposes, and prompt action should be taken at once to remedy the many existing evils in order to provide more adequate protection and better methods of sanitation for the hundreds of children who are in daily attendance.

THE LATEST ADDITION to the skyscraper district of New York City, will be a thirty-six storey structure, 447 feet in height. It will have a central tower flanked to certain prescribed height by wings on each side. The building, which will be erected by the Century Investment Company at a cost of \$4,600,000, will be equipped with thirty elevators.

* * *

GERMAN ARCHITECTS AND BUILDERS continue to evolve ideas for fireproof theatres. One of the newest suggestions has been made at Munich by Architect Helbig, who proposes the reconstruction of the Prince Regent Opera House at Munich. The central idea is that all the stairways of the building shall be on the outside so that spectators in all parts of the house shall have immediate access to the open air. Herr Helbig has submitted drawings embodying his plan, which reveals considerable architectural beauty as well as practical utility.

* * *

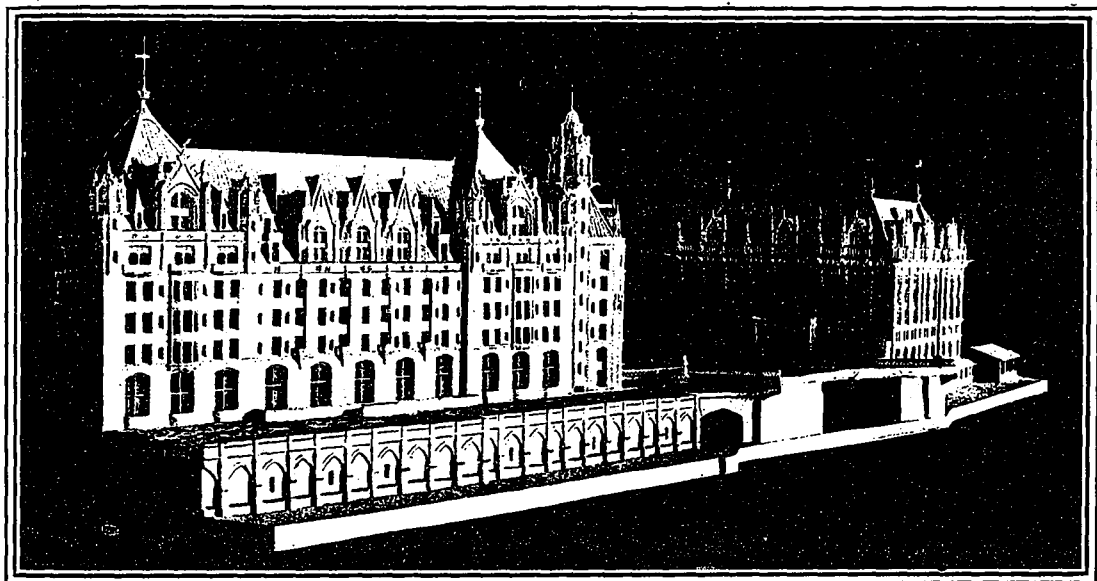
A RECENT COMMUNICATION to the Department of Trade and Commerce, Washington, D.C., states that American capitalists will commence the construction of a standard gauge steam railway from Kamloops, British Columbia, to Salmon River, a distance of 40 miles, early this spring, for the purpose of providing transportation facilities for the large beds of gypsum on the Salmon river. The plans include a \$100,000 plant at Kamloops, where the gypsum will be manufactured into plaster of paris and by-products, employing 200 to 300 men. There are 285 acres of gypsum deposits at Salmon River.

* * *

THE PRACTICE OF CONSTRUCTING breakwaters and the submerged parts of piers with concrete inclosed in bags has been largely developed in Scotland. The concrete is prepared as near as possible to the place where it is to be used. It is inclosed in bags to protect it temporarily from effects of contact with sea water while it is lowered into place. The bags are placed in a box suspended directly over the spot where they are to lie. The touching of a trigger opens the box and allows a bag to drop out. A line of bags having been deposited, the longer axis of each bag is so arranged that the meeting edges of two of the bags in the lower row will be covered. Thus a regular wall is built up, and as the concrete hardens it becomes solid and unmovable.

* * *

PERMANENT ORGANIZATION of the Canadian Cement and Concrete Association was effected at a meeting held in Toronto, April 20. Inaugurated under the patronage of many of the best known manufacturers, engineers, contractors and dealers in the Dominion, the new organization will give a fresh impetus to the interests which it represents. The object of the Association is to bring together all those in any way interested in cement and concrete construction, with a view of obtaining a more uniform standard in all branches of the work, and of promoting the industry in general. In connection with the annual conventions, exhibitions will be held at which the public will be given an opportunity to view the progress and accomplishments of cement and concrete as building materials. The following have been selected as officers for the ensuing year: President, Peter Gillespie, of the School of Practical Science, Toronto; vice-president, C. F. Pulfer, Ideal Machine Co., London; secretary, A. E. Uren, 62 Church street, Toronto; executive committee, T. Dates, Sun Portland Cement Co., Owen Sound; F. B. Kilbourne, Lakefield Portland Cement Co., Montreal; G. Kahn, Truss Concrete Steel Co., Toronto; K. Stinson, Stinson-Reeve Builders' Supply Co., Montreal; R. A. Rogers, Toronto; J. G. Murphy, Excelsior Construction and Paving Co., Toronto, and C. H. Thompson, Canadian Art Stone Co., Toronto.



PLASTIC MODEL OF THE PROPOSED TERMINAL AND HOTEL TO BE ERECTED AT OTTAWA SHOWING THE ESPLANADE OVER TRACKS RUNNING PARALLEL WITH THE CANAL IN THE FOREGROUND OF THE HOTEL ON THE LEFT, AND THE STATION BUILDING AND TRAIN SHED LOCATED DIRECTLY ACROSS THE PLAZA. MR. BRADFORD LEE GILBERT, ARCHITECT.

OTTAWA'S PROPOSED TERMINAL---New Central Station and Chateau Laurier to be Laid Out on a Magnificent Scale in Which the Landscape and Environs Will be Important Features.

TO those who are familiar with Ottawa, Canada's beautiful Capital, it is not difficult to recall the view that greets the tourist after climbing the stairs of the old station to the plaza formed by the junction of the Dufferin and Sapper bridges. It is from this point of vantage that the traveller gets his first glimpse of the city and the panorama which meets his gaze is such as to make a favorable and lasting impression. The magnificent view down the Rideau Canal locks across the Ottawa river to the Gatineau mountains beyond, the prominent and imposing buildings on Parliament Heights, as well as the beautiful view across Major's Hill, are all well within the range of vision.

The one incongruity to confront the new arrival has been the old station itself, but as this structure is soon to be replaced by a more imposing edifice and the site immediately across the intersection enhanced by the erection of a magnificent hotel building to be known as the Chateau Laurier, Ottawa will soon be provided with a terminal that will be entirely in keeping with the grandeur of its natural surroundings.

Both of these buildings have been designed in French Gothic, which will not only harmonize with the present Parliament Building, but also with the proposed Gov-

ernmental Buildings to be located further north and east in Major's Hill Park. The new Central Station will cover a ground area of about one hundred and seventy feet square, and will be situated nearer Rideau street or the bridge plaza, than the present station. It will, however, set back far enough from the bridge to form an additional plaza, above the level of the track, of approximately twenty-four feet in width.

Connecting with the station in the rear and running parallel with the canal, a passenger train shed and concourse will extend about fifteen hundred feet, while on the side of the shed opposite the canal will be located the baggage annex, express rooms, power plant, etc., running along the axis line of Sussex street, which will be widened and extended to the new plaza for carriages and traffic at the track level, and laid out in a similar manner to the plaza at the Bonaventure station, Montreal.

The general waiting room in the shape of a cruciform having a central dome, together with the ticket offices and other departments, is located at the track level. The floor of this room as well as the walls up to a height of twenty feet, will be of marble. In addition to the usual private rooms for men and women which will be generous in their dimensions, a special suite of waiting rooms, having a private entrance, has been arranged

for government officials and distinguished visitors at the Capital. This suite having every facility of convenience and comfort, will be fitted up in a manner consistent with the dignity of purpose for which it is to be used.

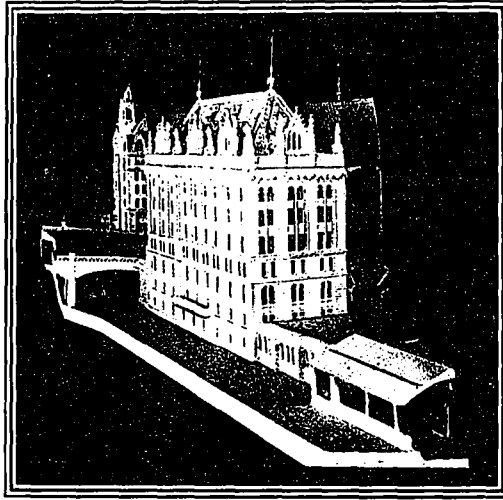
From the general waiting room the main stairway will lead up to Rideau street and also to the bridge plaza, which will be one of the principal features of the landscape.

The upper portion of the station will be devoted to railroad offices, which will also be reached through a private entrance. All departments in this section of the building have been planned along modern lines and so arranged as to facilitate the transaction of business between them. From the passenger concourse and train sheds a separate and generous exit will lead directly to a point on the bridge plaza which is to be about thirty feet further back from the street than the point reached in this

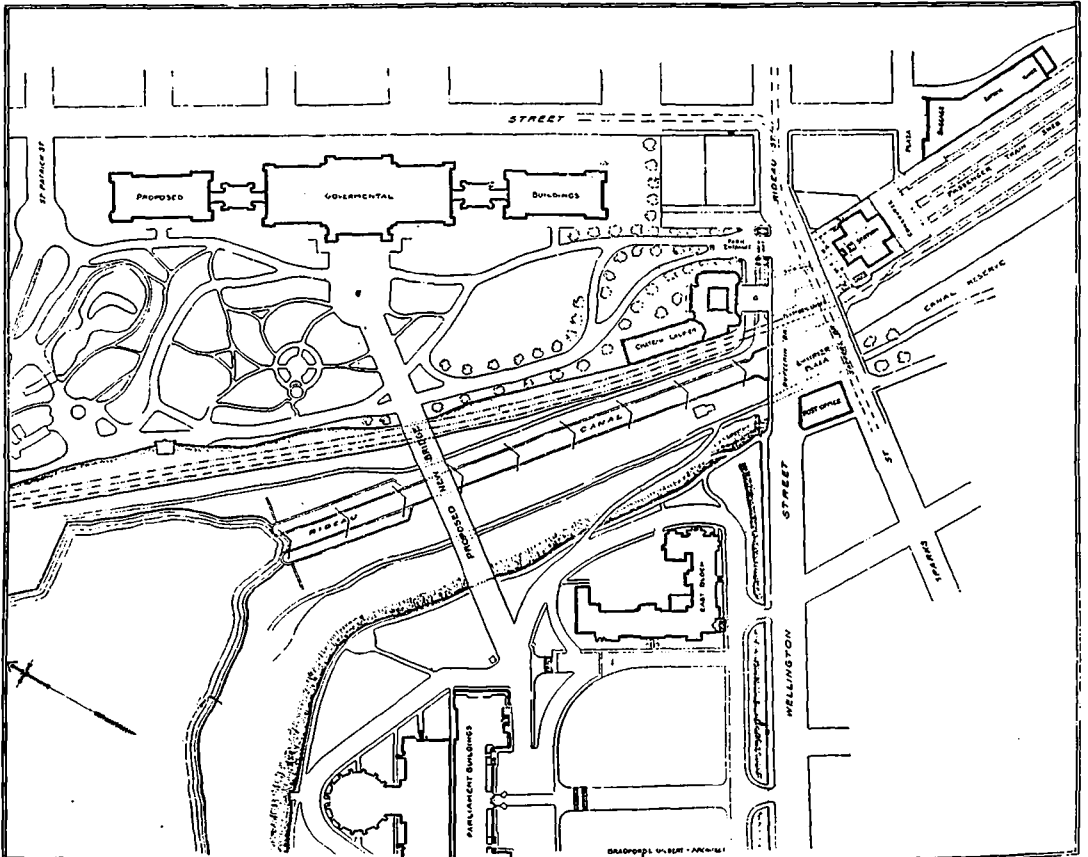
manner under the arrangement at the present time. Directly across the plaza will be located the Chateau

Laurier, which will connect directly with the station underground by means of a generous and well lighted subway. Including the subway, train shed, etc., the entire area under roof at the track level, will extend a total length of about two thousand feet. The Chateau Laurier will occupy what is at present a very unsightly corner of Major's Hill Park overlooking the canal.

When completed it will add greatly to the beauty of the park, and taken in connection with the station will dominate the main entrance gateway to the "Washington of the North," shutting out the unsightly structures east of the plaza and giving a distinguished and very artistic aspect to the whole surroundings. The hotel is laid out on a very generous scale so far as public and private rooms and conveniences are concerned.



MODEL OF PROPOSED CENTRAL STATION, SHOWING THE WING ALONGSIDE OF CANAL WITH TRAIN SHED IN REAR AND THE DOME OF GENERAL WAITING ROOM IN COURT BEYOND THE CONCOURSE. MR. BRADFORD LEE GILBERT, ARCHITECT.



GENERAL LANDSCAPE PLAN, GIVING AN EXCELLENT IDEA OF THE LOCATIONS OF THE PROPOSED CENTRAL STATION AND CHATEAU LAURIER TO BE ERECTED AT OTTAWA, AND THE ENVIRONMENTS WITH WHICH THEY WILL BE SURROUNDED, AS WELL AS THE RELATIVE LOCATIONS OF THE PARLIAMENT BUILDINGS AND THE PROPOSED JUSTICE AND DEPARTMENTAL BUILDING

it will contain over three hundred guest rooms, besides an unusual number of baths. All rooms, including the bathrooms, open on the outside and will be furnished and equipped along lines that will assure every comfort for the guests and visitors.

Over the tracks adjoining the hotel, will extend a broad terrace or esplanade about three hundred and seventy feet in length and seventy feet in width, which will overlook the canal locks and afford a splendid survey of Parliament Heights, and also form with its statuary, fountains, shrubbery and horticultural effect, a delightful spot and outlook for the afternoon and evening promenade. The service to the hotel will be from the present roadway under the viaduct, which will form the main entrance from the bridge approach to the hotel at grade.

The exterior of the hotel will be of stone, with roof of copper, as will that of the station, and both buildings will be of fireproof construction throughout. The entire expenditure of the proposed improvement will amount to over \$2,500,000 exclusive of land.

Without a doubt, the general scheme so admirable in its conception, is due to the unrestricted latitude given the architect. Until recent years, whenever propositions of this kind were to be worked out, it was usual for the owners to set aside stated ground area and request the architect to design a structure adapted to the dimensions of the same. However, of late, and especially so with large undertakings, it is becoming more customary for the architect not only to design the buildings, but suggest the general layout and the arrangement of the structures in connection with the land and environs, as it is conceded that only by such means can desirable and satisfactory results be accomplished.

The working out of the Ottawa station and hotel with adjoining buildings and structures was placed in the hands of Architect Bradford Lee Gilbert, of New York and Ottawa, who has had a broad experience in this particular line of work, having not only planned the Grand Central Station at 42nd street, New York, but also the 12th street station at Lake Park, Chicago, the terminal for the various roads in the City of Mexico, Atlanta and other cities; as well as having been associated in connection with the erection of the terminal at Halifax and the present large addition to the Windsor Hotel, Montreal.

Associated with Mr. Gilbert in carrying out the present project is Mr. C. P. Meredith, of Ottawa, whose energy and practical professional skill is counted on to see that the work is properly executed. Much credit is due Sir Wilfrid Laurier for the fact that Ottawa is to be endowed with these magnificent structures, as it was primarily through the interest he manifested in this project that Mr. Hays, Vice-President and General Manager of the Grand Trunk Railway System, took up the matter in earnest and agreed to spend so large a sum for the mutual benefit of the city, the travelling public and the railway itself.

The actual construction of the building will be expedited with all due speed and it is expected that within the next two years the structures will be completed and ready for occupancy, as it has been agreed to proceed with the work as soon as the weather permits, as the plans and specifications have been completed and only several matters of minor detail remain to be decided.

CONVENTION OF A. L. OF A.

THE Architectural League of America announces that the date of its next convention has been fixed for September 17, 18 and 19, at Detroit, under the auspices of the Detroit Architectural Club. All members of the League are urged to be present, as not only will they

have an opportunity to enjoy the personal pleasure and benefits to be had by attending, but will also add to the interest and enthusiasm of the meeting by giving it the sanction of their presence. For the information of those who desire to secure the Architectural Annual, before the supply is exhausted, it is announced that the same can be secured from M. A. Vinson, 205 Caxton Building, Cleveland, Ohio. The Annual contains many items of interest to the members of the League relative to the various architectural clubs and many illustrations of important works and articles of interest to the profession at large.

The revised constitution and by-laws which were amended to meet the requirements and conditions governing individual membership which was established the first of this year, can be secured by applying to H. S. McAllister, Permanent Secretary, 729 15th street, N. W., Washington, D. C.

ARCHITECTURAL INSTITUTE OF CANADA.

WITH the "close corporation" clause eliminated, and modified by the excision of several other provisions of minor character, the bill to incorporate the Architectural Institute of Canada was passed by the House of Commons, March 31.

Having as its main objects the elevation of the profession, and the development of a higher standard of architecture in Canada, the Institute should not only receive the moral and material support of every architect in the Dominion, but the endorsement of every person who admires esthetic attainments, or who appreciates architecture as a medium of expression.

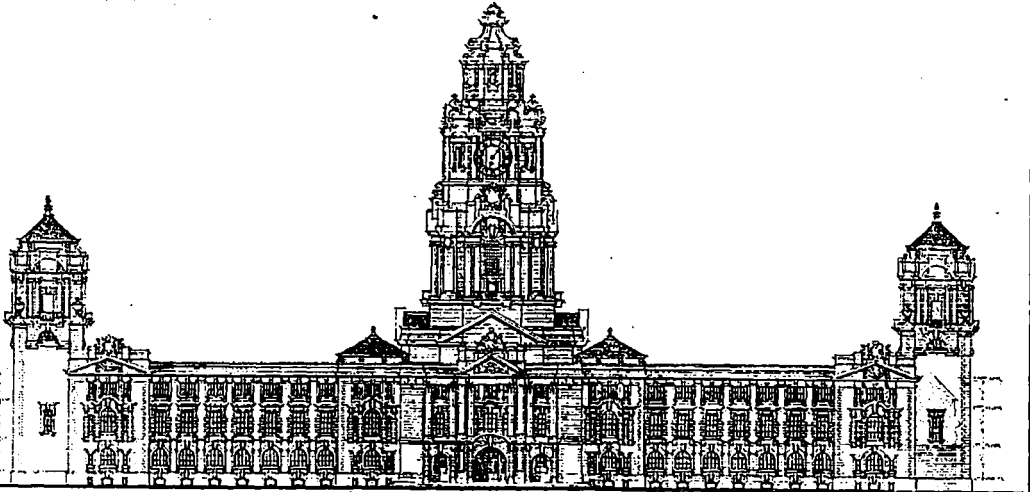
Identified with the Institute are many of the leading practitioners in Canada, a fact which in itself is sufficient to presage a most brilliant career of activity and usefulness for the organization, and as a legally responsible body having lofty ideals, it should prove to be a most potent factor in the advancement of architectural education.

According to the provisions of the Act, members in good standing of the province Quebec Association of Architects, the Ontario Association of Architects, the Alberta Association of Architects, the Manitoba Association of Architects, the Toronto Architectural Club, and the Regina Architectural Association, are eligible to membership upon the payment of the entrance and subscription fees, required by the by-laws of the Institute. Other persons, not members of any of the foregoing associations or clubs, who have practiced for two years as architects in Canada, may be admitted to membership, upon condition of each application being supported by affidavits proving the qualifications of the applicants. The Council may also admit to membership any member in good standing of any Canadian, British or foreign Association of Architects, upon such member presenting his credentials and paying the required admission and subscription fees.

The new law makes it mandatory that the Council, which consists of the first twenty persons named in the bill as incorporators, shall meet within six months after the passage of the Act for the purpose of organization, the making of by-laws, the election of officers and the transaction of any other business that may arise. It also provides that the first general meeting of the Institute shall be held during the present year at Ottawa at such time as the Council provides.

Provincial rights are protected by providing that the bill shall in no way encroach upon the privileges accorded to any association of architects by provincial charters.

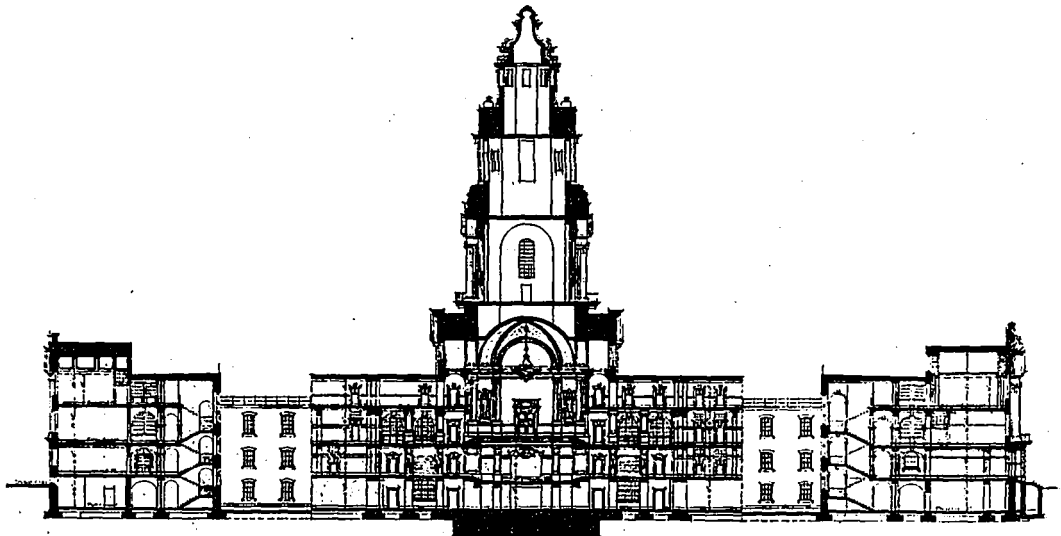
• PROPOSED LEGISLATIVE •
• & EXECUTIVE BUILDING •
• REGINA • SASKATCHEWAN •



• MAIN ELEVATION •

MAIN ELEVATION, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK.
MITCHELL & RAINE, ARCHITECTS.

• PROPOSED LEGISLATIVE •
• & EXECUTIVE BUILDING •
• REGINA • SASKATCHEWAN •



• SECTION CD •

SECTIONAL ELEVATION, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK.
MITCHELL & RAINE, ARCHITECTS.

RENAISSANCE DESIGN OF ENGLISH ARCHITECTS--- Messrs. Mitchell & Raine of London, England, Submit a Most Inter- esting Conception in Renaissance Style of Architecture for the Proposed Saskatchewan Parliament Building.

RENAISSANCE is a style of architecture most uncommon in government buildings in Canada, which fact renders the design of Mitchell & Raine, of London, Eng., and Montreal, for the legislative and executive building to be erected at Regina, especially noteworthy. Their design is quite distinctive in its general scheme from all the others submitted, and is comparatively simple in general effect, with the exception of the three towers, which are rendered rather ornate. To relieve the general severity of the design and give it that imposing character to be desired in a structure of this class. The color scheme suggested is a good one. The contrast of the white stone trimmings on the background of red brick as treated by the designers would produce a pleasing, unpretentious effect.

The plan has been carefully worked out in detail and the drawings, as reproduced herewith show intelligent study. In all, the design is a good example of the Renaissance in government building architecture.

In submitting their design Messrs. Mitchell & Raine declare that while they have endeavored to produce a dignified and beautiful design, utility has in no way been sacrificed to gain architectural effect.

The designers claim to have endeavored to comply with the conditions in all respects, and to produce a design which would be suitable in every way to the requirements, and one which, from its simplicity of plan, would result in a building most easily controlled and which would be constructed with due consideration to climatic conditions.

The plans are self-explanatory, but attention is called to the fact that departments have been concentrated so as to facilitate the business between them.

BLOCK PLAN.

The plan shows the proposed position of the building on the

site, with its main facade facing north toward the "Wascana Lake." The proposed "future extensions," as shown, would probably be sufficient for all further requirements, and when completed would form a group of buildings of which Regina might be justly proud. The "power station" is on the south side of the site, and is placed on the main axis. In this position it is central with the whole group of buildings and at the same time far enough removed from them to avoid any annoyance from smoke, noise, dust or disagreeable odors. The floor of the boiler house would be sunk below the ground level, so as to be on a level with the coal storage, the coal being deposited through shutters from the ground level.

GROUNDS.

The lay-out of the grounds is merely a suggestion, partly in conformity with the arrangement as on the "block plan" submitted.

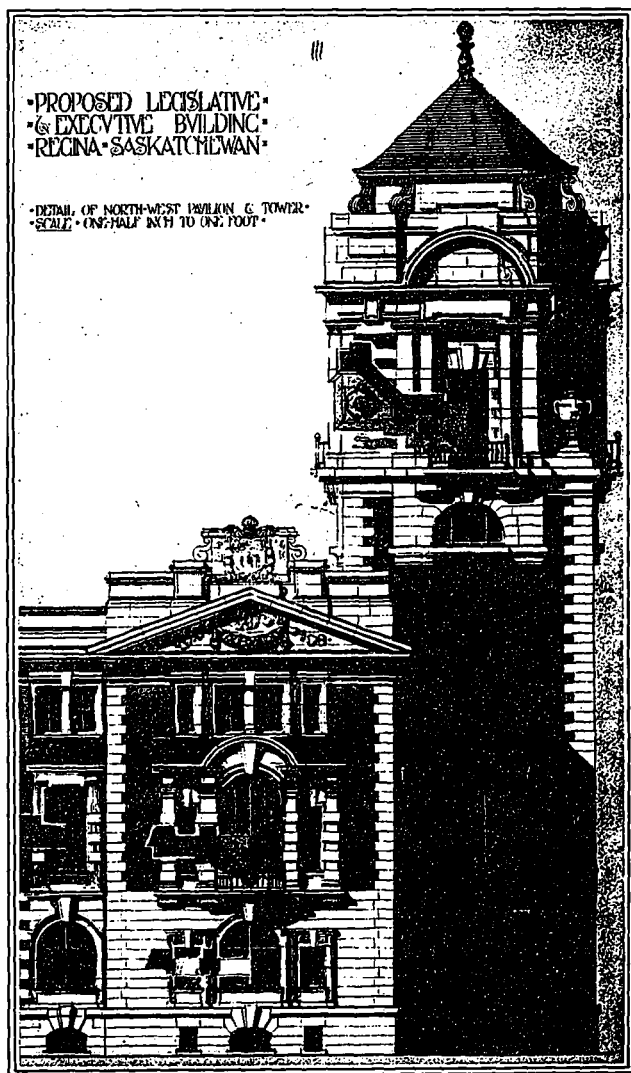
APPROACHES.

The positions of the main approaches have been maintained, in accordance with the programme. They lead directly off Albert street to the several entrances. The approach from the lake is by way of a landing with flights of steps to the terrace above, which would be enclosed on the water front by a balustrade, and from thence by an avenue between lawns to the upper terrace on the north facade

ENTRANCES AND STAIRCASES.

The main entrance is on the north facade. The administrative entrance is on the west, while a private entrance for members is arranged at the centre of the south facade.

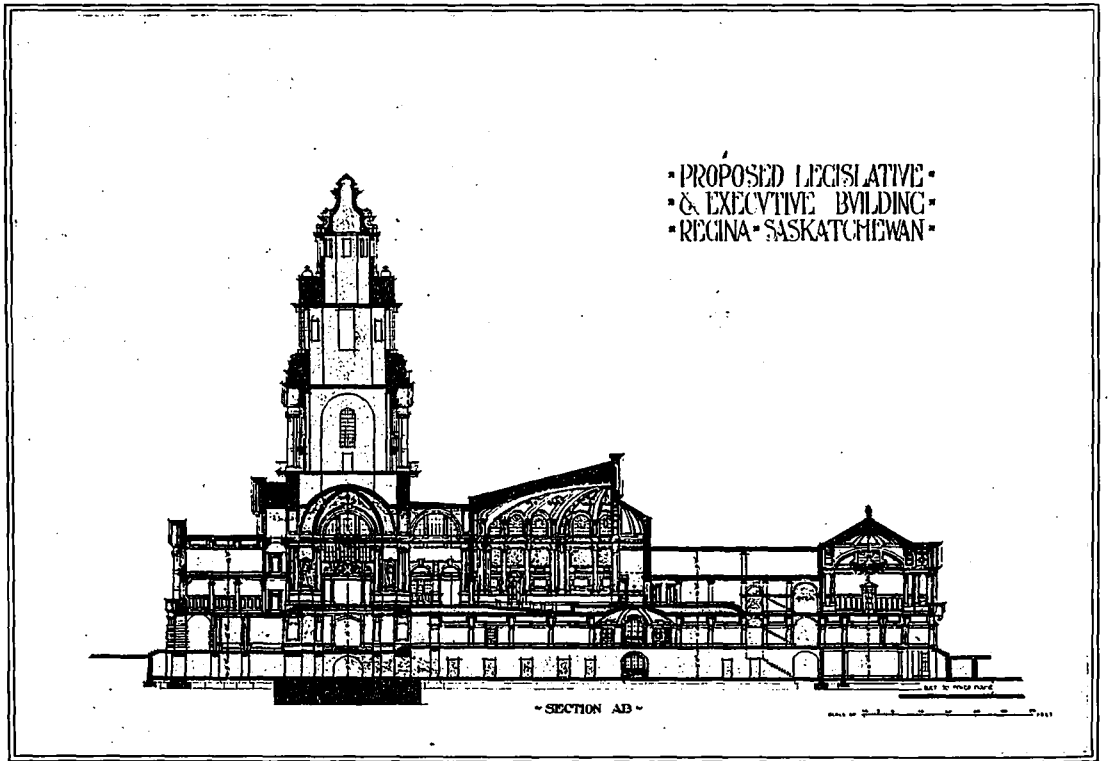
At the southeast angle there is an entrance for tradesmen, with a service lift in close proximity to the kitchen and store in the basement. At this entrance there is a staircase which could be used by surveyors, etc., for reaching the room in the basement, where the Public



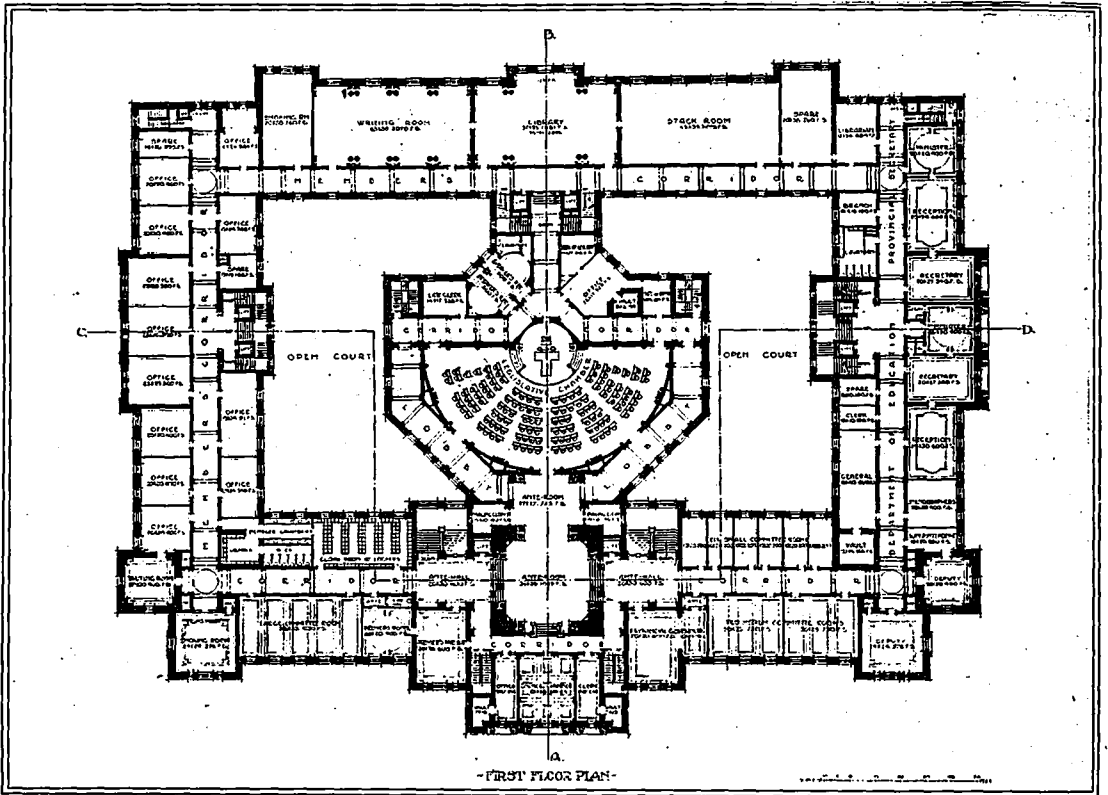
DETAIL OF NORTH-WEST PAVILION AND TOWER. COMPETITIVE DESIGN FOR THE PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING AT REGINA, SASK. MITCHELL & RAINE, ARCHITECTS.



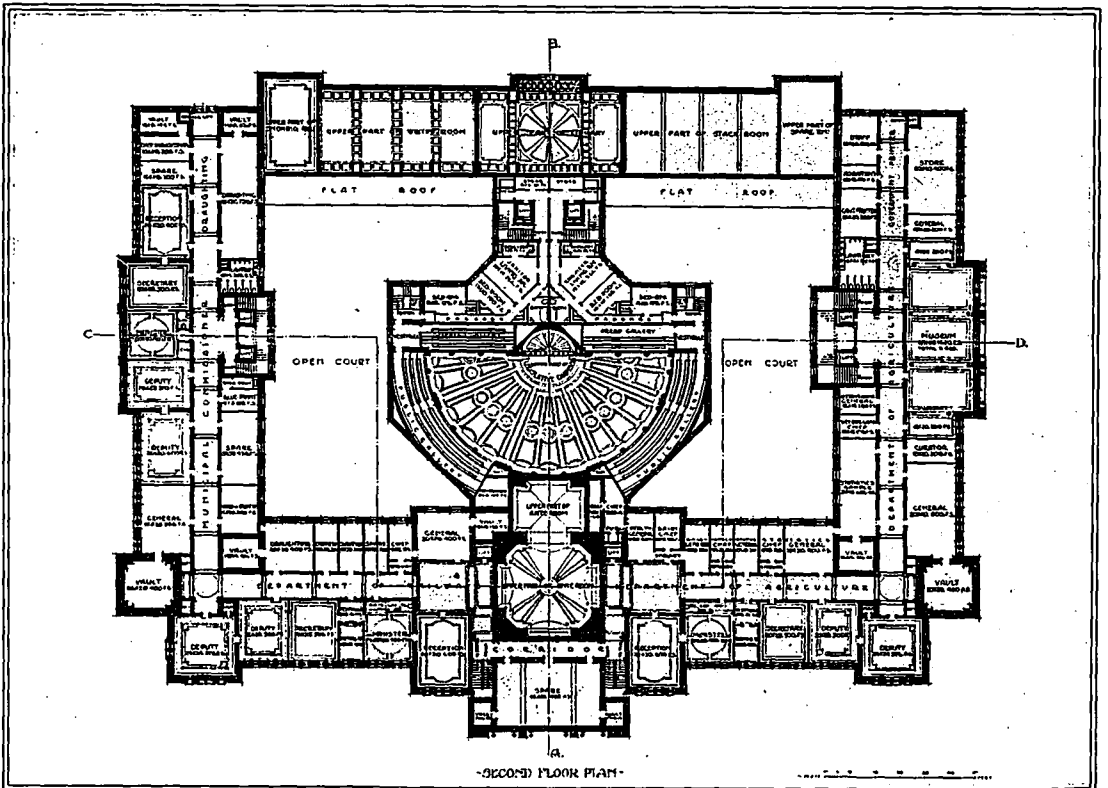
SIDE ELEVATION, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK.
MITCHELL & RAINE, ARCHITECTS.



SECTIONAL ELEVATION, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK.
MITCHELL & RAINE, ARCHITECTS.



FIRST FLOOR PLAN, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK.
MITCHELL & RAINE, ARCHITECT.



SECOND FLOOR PLAN, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK.
MITCHELL & RAINE, ARCHITECTS.

cials of the chamber directly behind and in close proximity to the same.

The seating capacity is for 128 members, and the seating space and passages are on a generous scale.

The lighting is through a clerestory, which would give a beautiful and diffused light throughout the whole chamber. The architecture is simple and dignified, and it was considered that a room executed on these lines would prove exceedingly handsome and satisfactory in every respect. The galleries are placed immediately over the lobbies and corridors surrounding the chamber. They are easy of access from their own special staircases and have an ample seating capacity.

VAULTS.

These are provided for all departments where asked for, and a set of vaults for archives, etc., is placed in a central position in the basement. The total vault space of 10,000 feet and storage space of 20,000 feet is provided for as requested.

DUCTS.

These have been placed at six points in the building and they are easy of access for ventilation, pipes, wires, etc. Two ducts are also provided for the legislative chamber.

LIGHTING.

The whole of the building has direct and ample light, and the plan is well adapted to a simple and effective system of heating and ventilation.

LAVATORIES.

These are placed on stack and in close proximity to the staircases. They are at equi-distant points throughout the building and are of ample size.

CORRIDORS.

These are so placed as to conveniently reach all parts of the building. They are spacious, direct and well lighted, and would be continued on a straight line into the "proposed future extension" by removing the windows at the ends.

DETAIL DRAWINGS.

The detail drawing of the northwest pavilion and tower is characteristic of the building generally, and for this reason this portion was chosen. The legislative chamber was selected for the interior detail on account of its being the most important room in the building.

GUARANTEED STATEMENT OF CUBIC CONTENTS.

Basement	809,412	@ 25c.	202,353	cu. ft.
Ground floor	809,412	@ 35c.	283,290	
First floor	944,314			
For extra height in library, writing room, etc.	50,780	@ 40c.	448,844	
For extra height in legislative chamber, lobbies, etc.	127,024			
Second floor	616,781	@ 35c.	241,010	
Extra for ante-room	71,325			
Extra for small towers above main roof	61,250	@ 40c.	24,500	
Lower portion of main tower above roof	79,902	@ 40c.	31,960	
Upper portion of main tower above roof	50,979	@ 50c.	25,500	
			<u>\$1,257,557</u>	

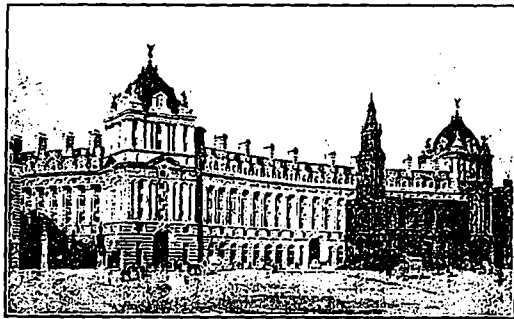
S EVENTY-NINE reinforced concrete buildings have been erected or are now under construction in San Francisco, according to Mr. Wm. Ham. Hall. One is a ten-storey structure and sixteen are over six storeys. Fourteen are stores, thirteen are office buildings, ten are warehouses, six are factories, and two are power stations.

CANADIAN BUILDING IN LONDON — A Brief Description of the Proposed Canadian Government Office Building to be Erected on the Strand.

FOR many years the proposal to bring together and centralize Canadian interests has been more or less a live subject in London diplomatic circles, but many difficulties, among which the selection of a favorable site was not the least, blocked the scheme. The opportunity finally came when the London County Council undertook to make a new highway, connecting the two great thoroughfares of the Strand and Holborn, at the same time removing several acres of ancient buildings that were considered veritable eyesores.

This devastation afforded the very opportunity for an admirable site upon the vacant plot in the Strand. An option has now been secured by the Canadian authorities, largely through the efforts of Mr. C. H. Wilkinson, of the British Columbia Development Association Limited, and Architects Marshall Mackenzie & Son were instructed to prepare a design for the proposed \$2,500,000 structure which will give housing to the Canadian Federal and Provincial Government Offices, a Canadian Club, residential flats and various Canadian mercantile houses in London. The building will have a frontage to the Strand of 415 feet and 130 feet to two side streets.

The Strand facade will be crescent-shaped and colonnaded, and will thus form a pleasing background to the



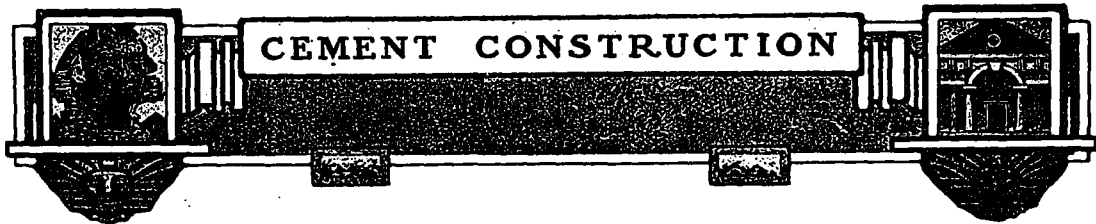
PROPOSED DESIGN OF CANADIAN OFFICES IN THE STRAND.

old church of St. Mary-le-Strand, which was designed by Gibbs, one of the famous architects of the seventeenth century, to whom so many London churches owe their beauty.

The facade to the Strand is to be flanked by handsome wrought iron gates, which will lead to the two side streets. These streets are to be of a semi-private nature. The gate on the west will be named at Vancouver Gate, in memory of Captain William Vancouver, the famous navigator and explorer, and that on the east will be called the Jacques Cartier Gate, to commemorate a name equally famous in Canadian history. The names of Lord Strathcona, Sir Wilfrid Laurier, and other prominent living Canadians will also be commemorated, the various halls in the interior of the building being named in their honor.

The ground floor of the building will be let for shops, shipping offices, and similar purposes, while the parts of the upper floors facing the side streets will be made suitable for residential flats. It is also proposed to devote part of the upper floors for the use of a Canadian club. From the top floor will be obtained a magnificent view of London, the whole reach of the Thames from the Tower Bridge to Westminster Bridge being visible. The cost of the proposed structure will be about half a million sterling.

Mr. Mackenzie and his son, who designed the offices, are Aberdeen men, and were the architects of the new wing which was recently added to Aberdeen University, of which institution Lord Strathcona is Chancellor.



THE EDISON CONCRETE HOUSE---The Purpose of the Inventor. Scheme Has Many Impracticable Features. Mr. Edison Mistaken in his Estimates. By E. S. Larned, C.E.*

The interest awakened in Canada by the descriptions printed in the daily press of Mr. Edison's monolithic house should render the criticism of Mr. E. S. Larned, C. E., of Boston, Chairman of the Committee on Tests of Cement and Concrete of the National Association of Cement Users, and a well-known writer on these subjects, together with that of Mr. Percy H. Wilson, Asso. Mem. Am. Soc. C. E., and secretary of the Association of American Portland Cement Manufacturers, published by Cement Age, New York, of considerable interest to the readers of "Construction."

In view of the increasing demand for low-priced, well-built houses for the working class in Canada's larger cities, "Construction" has arranged with the publishers of Cement Age for the sole right to publish this article in Canada, believing that the conclusions of these eminent engineers concerning the practicability of this much talked of solution would prove of value to those of our readers most concerned with this problem.

IN view of the past achievements of Mr. Thomas A. Edison in the field of inventions, it is perfectly natural that his ideas of a poured one-piece concrete house should receive wide notice and command thoughtful attention.

The wonderful successes and developments in the use of Portland cement in all forms of construction have come to be the subject of general knowledge, and for this reason alone, if for no other, the public mind is inclined to accept this new idea of house construction with confidence in its possibilities, and those of the poorer classes, for whom it is expressly intended, are anxiously awaiting its first practical demonstration.

Mr. Edison's enthusiasm and confidence in the successful development of his plan, and his expressed willingness to expend from \$40,000 to \$50,000 to demonstrate its success, is at once a challenge to the skeptic and a promise to all interested, not alone in the more extensive use of cement, but even in the improved moral and social conditions of the laboring classes.

Many changes will doubtless be made in the design of the building, methods of conducting the work and proportions of concrete used, but no one now doubts that a safe, sanitary, fireproof, durable, attractive and economical house can be made of concrete, because such houses are numerous throughout this country and abroad, and rapidly growing in favor.

Time and cost in building construction are both factors of prime importance and closely related. These are the elements Mr. Edison seeks to simplify and reduce to a minimum, and his present plan can, in all fairness, only be called tentative.

THE PURPOSE OF THE INVENTOR.

Mr. Edison states that his idea of a cheap concrete

house is primarily intended for families living in the congested tenement districts of the large cities, who find at present a minimum rental of \$9 per month for two or three small rooms with poor light, poor air, poor sanitation, accompanied with appalling fire risks and generally unattractive and demoralizing surroundings.

Mr. Edison claims that the cost of the proposed house is estimated at \$1,200, including plumbing, heating and lighting fixtures. The house is intended for two families, and the rental required on a 5 per cent. investment basis would be sufficient under the present conditions to more than cover the expense of transportation of the head of the household.

APPEARANCE OF THE PROPOSED HOUSE.

The photograph published herewith, Plate No. 1, shows the proposed house. It suggests a building more attractive in appearance than usually occupied by families for whom it is intended, and while Mr. Edison recognizes that moulds for a less ornate building could be produced for much less money, he holds that the small additional expense representing not over an annual interest charge of \$40 in the cost of the forms, is more than justified by the improved appearance and the general satisfaction of the occupant and community at large.

It may be suggested, however, that the design seems poorly adapted to concrete construction, owing to the irregularity of outline and amount of detail attempted. This is a matter of judgment and taste, and, of course, could be modified at will.

The proposed size of the building is 21 ft. by 49 ft. and 35 ft. high, not including the cellar. The walls will be 12 inches thick reducing to 8 inches on the second storey, and it is proposed to make the roof 6 inches thick. The floors and all partitions will be uniformly 4 inches thick.

IMPORTANCE OF LOCATION.

Mr. Edison's idea is to construct these buildings upon sandy or gravelly areas, furnishing material for the concrete from the necessary excavations. The purpose of this, of course, is obvious in reduction of first cost, providing suitable materials can be found within the limits of the necessary excavation, but this limitation, if imposed, would seriously restrict the development of this class of buildings, for the reason that few areas adapted to cheap construction will be found furnishing satisfactory material for concrete, or material in sufficient quantity for construction within the limits of the cellar excavation and in the majority of instances the sand and gravel or crushed stone would have to be brought to the work from sources as nearby as possible.

CONSTRUCTION OF FORMS.

The moulds will consist of cast iron plates. The exterior plates for the wall forms will probably be from 3-4 in.

* published by special arrangement with Cement Age, New York.

to 7-8 in. in thickness; the interior plates 1-2 in. in thickness; the underside of the floor moulds and roof moulds probably from 3-4 in. to 7-8 in. thick, while the upper side will probably be 1-2 in. thick. The moulds for interior partitions will probably be 1-2 in. plates. All mould plates are to have milled edges and faces with flanged joints drilled for dowel pin and bolt connections. The inside faces of the mould plates will be nickel-plated or faced with brass where intricate tracery and detail is attempted in the finish.

It is expected that two houses per month can be constructed from one set of forms, and in order to secure a reasonable variety in design it is proposed to have six sets of moulds, the approximate cost of the six sets being about \$105,000, but if one set only be provided, the first cost would be \$25,000.

The exterior and interior wall plates are connected and held in relative position by rods in pipe sleeves. In the use of cast iron for mould plates the probability of occasional breakage in handling must not be overlooked, and the question of time and cost of renewals is of the utmost importance.*

Mr. Edison proposes to erect and take down the forms by means of four small electrically driven derricks, and expects that it will take two days for erection and two for removal.

The preliminary estimate of the approximate weight of the moulds for one house is 230,000 pounds; the writer's estimate amounts to something over 450,000 pounds. In either case, the question of transportation of these moulds by railroad or team is not only an item of considerable expense, but suggests also the possible necessity of protecting some of the more intricate and decorative moulds by crating, in order to avoid breakage, which, of course, would add materially to the expense.**

THE REINFORCEMENT.

The reinforcement proposed for the floors and roof, and elsewhere where needed, will consist of 1-2 in. and 3-8 in. rods. It is not yet definitely determined whether they will be round rods or some system of deformed bars. It is proposed to place all of the reinforcement in position in advance of the concrete operations, and the rods

will be held in their relative positions by wiring or spacers.

FLUES AND PLUMBING.

Pipes for gas, water and all plumbing, also ducts for electrical wiring, are set in position in the form in advance of concreting, and the flues for chimneys are formed by thin metal forms which are left in position.*

MIXING PLANT.

It is proposed to have a 100 H. P. boiler and engine on trucks furnishing the power to drive motors connected with the four small derricks, concrete mixers, elevator-plant, which will also furnish any other power required.

It is also proposed to install three or four large mechanical mixers on the ground adjacent to the building.

These mixers so arranged as to discharge into a storage hopper, from which the concrete is conveyed by bucket elevator to the distributing hopper at the top of the building, from which the material flows through pipes into the moulds. A specific gravity device is to be attached to the storage hopper, and the consistency of the mix carefully watched and kept uniform.

It is further intended to use plungers, power driven, operating from the top in the moulds as the concrete rises, to keep same

agitated, and prevent the segregation of materials, serving also to expel the confined air, and secure a perfectly uniform face, and also assist in forcing the flow of the material into and throughout the horizontal passages.

Mr. Edison claims that in his experiments he finds that concrete of the proposed consistency and composition expands in setting a very small fraction of an inch in the greatest diameter of the proposed house, and he believed that subsequent contraction and expansion in the walls can safely be neglected in the reinforcement introduced.

PROPORTIONS OF THE CONCRETE.

Mr. Edison proposes to use a mixture of 1 cement, 3 fine sand and 5 stone or gravel, passing the 1-2 in. mesh sieve. He realizes that the serious problem involved is to prevent segregation of materials while being deposited and distributed, and claims to have solved this difficulty by the addition of colloids or some electrolyte in small

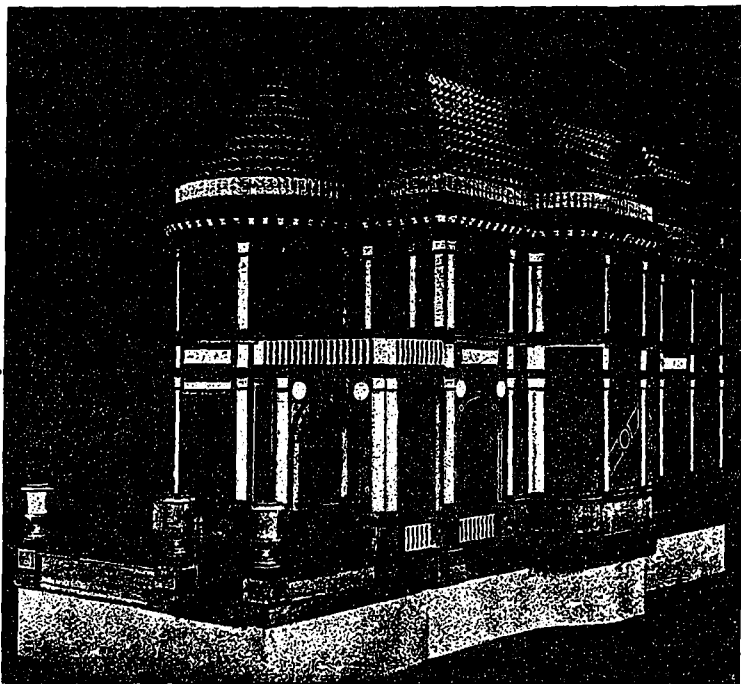


PLATE NO. 1—MODEL OF THE PROPOSED TWO FAMILY \$1,200 CONCRETE HOUSE.

*Mr. Edison states that this has been allowed for at 4 per cent. depreciation.

**Mr. Edison calls attention to the fact that houses are to be erected in rows and in large numbers at particular localities. Isolated work is no part of the scheme, hence transportation is a small item per house.

*Mr. Edison states that he has decided to put the pipes outside of the walls in most cases like hotel and sanitary plumbing.

quantity, which add to the viscosity of the combined material, facilitates the uniform flow and prevents segregation.

CONSTRUCTION OF FOUNDATIONS.

This preliminary step is attended with only one detail of special interest, and that is in the exact levelling of the top of the 12 inch monolithic cellar walls to receive the wall moulds.

WHAT EXPERIMENTS REVEALED.

At the West Orange laboratories a few experiments have been made to determine the flow of concrete and the illustration herein reproduced, plate No. 2, indicates the method pursued.

The first experiment represented by the two figures in the center of the picture consists of 4-inch board moulds, set vertically with two horizontal connecting ribs of the same size. The concrete in each case was poured into the top of the vertical member and flowed by gravity alone into the horizontal moulds and up the opposite vertical moulds, apparently filling same perfectly, and without any appearance on the exterior of the segregation of materials.

The last and most important test consisted of two upright members 10 feet in height, each 4 inches square in cross section, connected at the base by a horizontal form of the same dimensions. As one looks at the picture, the concrete was poured into the hopper of the left hand vertical mould by means of buckets intermittently emptied. The forms were not jarred during the flow of the material and as indicated in the right hand vertical form, the concrete succeeded in rising 54 inches above the base.

At the time of the writer's visit to the laboratory, the forms were still on this last section of concrete poured, and it was impossible to judge of the uniformity of the concrete formed. An examination of the photograph suggests at least a very smooth face on the side of the concrete exposed.

CONCLUSIONS AS TO COST, ETC.

It may be granted without question that a system of iron moulds accurately fitted and duly marked for quick assembling is entirely feasible. Mr. Edison's estimate of the weight, 280,000 pounds, is not borne out by a reasonably careful estimate, assuming from Mr. Edison's own statements that the exterior wall plates would be 3/4 in. cast iron, the interior wall plates 1/2 in., plates for the under side of floors and roof 3/4 in., with 1/2 in. plates for the upper side, and 3/4 in. plates for all partition walls.

We find approximately 20,000 sq. ft. of wall and floor area above the foundations, weighing approximately 450,

000 pounds, without taking into account the flanges, bolts and pins.

If \$25,000 be a fair estimate of the cost of moulds weighing 280,000 pounds, it would appear by simple proportion that moulds weighing 450,000 pounds, would cost about \$40,000. This is on the basis of 9c per pound, which must include planing the faces and edges of each mould plate, drilling of flanges for pin connections and drilling of plates for bolt connections, and nickle-plating on the side next the concrete. It will be noted in the above estimate of weight that no allowance whatever has been made for the cellar wall moulds. In the detailed estimate to follow, however, we will assume that \$25,000 is the cost of forms.*

For purposes of illustration, let us assume that the moulds and plant are delivered to the town f.o.b. cars, and have only to be hauled to the site of the building. The cellar has been previously excavated and is ready for concrete operations.**

It is proposed to erect the moulds by means of four small derricks, one at each corner of the building, and it is apparent that some assortment must be made as the moulds are delivered from the cars, in order to put the plates under the derrick which will place same in correct position.

Mr. Edison allows two days for the erection of the forms, including the placing of all reinforcement, the introduction of pipes or ducts for same and

flue forms, and it would certainly seem as if this time would be well occupied.

It is apparent, of course, that without a second set of moulds for use in building immediately adjacent, that the power and mixing plant must remain idle during the hardening of the cement, and the force of trained men which must be required for this operation also remains idle, or practically so.

It will probably take as long to remove the forms as to erect them, the chief difficulty being found in the plates

*Mr. Edison states that his draughtsmen made an error, but regarding the castings he can get them for 2.7 cents per pound and with planing at 4.80 cents per pound.

**On this point Mr. Edison repeats that his plan does not provide for isolated houses.

On the subject of molds Mr. Larned writes as follows: "I note in my statement of the size of the building that Mr. Edison gives the height as 35 feet, not including the cellar, whereas I supposed it did include the cellar. With this correction it becomes necessary to revise the estimate of the weight of the molds, and I find on a recomputation that instead of 450,000 lbs., they will weigh 630,000 lbs. This, of course, affects not only the cost of the molds but the cost of erection, removal and transportation, adding for railroad shipment four additional cars.

"I also desire to call attention to the fact that I have made no comment upon the fact that Mr. Edison apparently makes no provision for outside or inside staging to assist and facilitate the erection of the molds. In my judgment they cannot be erected without the use of staging and this introduces another element of cost which has been entirely omitted in my figures."



PLATE NO. 2—EXPERIMENTS TO DETERMINE THE FLOW OF CONCRETE IN WOOD FORMS 4 IN. SQUARE IN CROSS SECTIONS.

on the inside of the building, which, of course, cannot be handled by the derricks and must be taken down by hand.

Without an actual demonstration, it is useless to state that the work cannot be done in the time named, for this reason, an expression of opinion is reserved.

If, as estimated, two buildings per month can be constructed from one set of moulds, it is apparent that for the greatest economy the moulds should be used to their fullest capacity. This at once suggests the time necessarily lost by stormy weather, and in our Northern latitudes, the disadvantage and expense of attempting work of this nature during the months of December, January and February.

It is at once apparent that the construction of a single house by the method proposed would be prohibitive in cost, unless the houses upon completion so commend themselves by reason of their fireproof qualities, low cost of maintenance and practical indestructibility, that they would be in demand rather than cheaper forms of construction.

In this connection, it is of interest to note the extent of the equipment for railroad transportation. The moulds weighing 450,000 pounds would require 10 cars of 22½ tons capacity each, the derricks, boiler and engine and mixing plant would require at least 4 cars more, making a train of 14 cars, which, if transported at a fair average rate of \$2 per ton would amount to \$600.*

The whole idea of Mr. Edison's proposition is based upon the flow of liquids. Concrete, of whatever composition, can at least only be called a semi-liquid, and if the medium be sufficiently fluid to insure its flow under gravity alone, it would be, under natural conditions, impossible to maintain the aggregates in equilibrium or suspension.

This condition is also materially affected by the size of the aggregates used, and the rate of flow is likewise affected by the same elements.

There would seem to be no particular difficulty in filling the vertical moulds with reasonable certainty by pouring the concrete from the top of the building, but the flow of this material through the horizontal floor forms, impeded by the necessary reinforcement, held in position by wiring or spacers, with occasional splices, and perhaps crossings, is the doubtful problem, and unless segregation of materials be prevented, and the horizontal moulds completely filled before the initial set of the cement, it would be natural to expect irregular and incomplete results.

Mr. Edison proposes to facilitate the flow of the ma-

terial and assist in the prevention of segregation by the introduction of a colloid, which may be clay in a very fine state of division, an electrolyte, or possibly hydrated silica, any one of which will serve to reduce the mixture to a more or less gelatinous condition, and by the viscosity attained hold the aggregates in equilibrium or suspension.

In the opinion of the writer, the introduction of a colloid may assist somewhat while the material is in motion, but when it comes to a rest, as when the moulds are completely filled, it will not prevent segregation.*

The addition of a colloid would also, in the opinion of the writer, retard the hardening of the cement to such an extent as to seriously delay the removal of the forms.**

It is entirely unlikely that in such a mixture a concrete of 13-5 proportions in flat slab construction would be even self-supporting at the end of six days. This is further emphasized by reason of the necessity of using

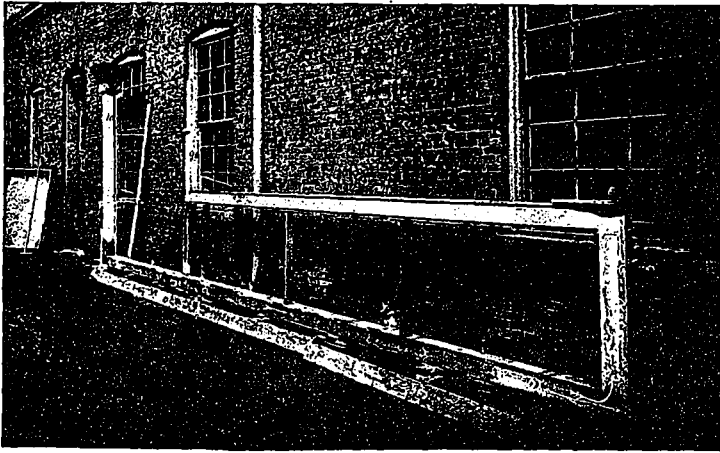
very fine sand, which of itself retards the hardening of cement, particularly in so lean a proportion as 1 to 3.

The addition of a colloid is also expected to render the concrete impermeable and make unnecessary any other waterproof treatment. Mr. Edison also believes that because of the low conductivity of concrete, no difficulty will be experienced from condensation of the inside of the walls, and it is proposed to

leave the inside surfaces produced by the mould plates without further treatment, unless tinting be desired for purposes of decoration. It is also interesting to note that no joints will be provided to take up contraction and expansion.

The use of plungers, power driven, to keep the concrete agitated and assist in its flow, is a very novel feature, and results will be observed with much interest. It would seem that plungers large enough to be effective would subject the moulds to considerable strain, and if the effect is violent enough to cause quick or unusual motion in the concrete, it suggests the possibility of the displacement of reinforcement, unless same be very rigidly fixed in position.***

In connection with the proposition to raise the concrete to the top of the building, by means of a bucket elevator, a computation reveals the following interesting facts, viz., if the buckets be of 1 cubic foot capacity each, they must discharge at the rate of 18 buckets per minute



THE RESULT OF THE LAST TEST MADE BY THOMAS A. EDISON TO DETERMINE THE FLOW OF CONCRETE IN THE FORMS. IT WILL BE NOTED THAT THE CONCRETE IN THE UPPER RIGHT HAND CORNER OF THE CASTING IS IMPERFECT. THIS WAS CAUSED BY THE FACT THAT THE PLUG AT THIS POINT WAS PULLED SHORTLY AFTER THE CONCRETE WAS POURED. EXCEPT FOR THIS ACCIDENT, THE CASTING IS PERFECT. THE ARROWS INDICATE THE DIRECTION OF THE FLOW OF THE CONCRETE FROM HOPPER INTO WHICH IT WAS POURED.

*This conclusion Mr. Edison insists is wrong.

**Mr. Edison takes exception to this statement adding that there is variety in colloids.

***On this point Mr. Edison states that the area of agitation cannot extend more than three feet.

*Concerning the table of costs Mr. Edison states that the actual construction will show how accurate are the figures given. As to the cost of transportation, etc., he says: "Suppose several hundred houses were erected at this spot, what becomes of the criticism on cost of transportation?"

to handle 200 cubic yards in ten hours. If of $\frac{1}{2}$ cubic foot capacity each, they must discharge at the rate of 36 buckets per minute. In either case, this means a belt or chain speed of from $\frac{1}{2}$ to $\frac{3}{4}$ more in each case, and the loading of the buckets by continuous discharge from the hopper suggests the possible waste of some material and the fouling of the chain or belts to an extent that would probably cause some trouble. It would be impractical to load the buckets full of such fluid material owing to waste.*

Mr. Edison has, undoubtedly, taken a bold step in the right direction, and the new ideas that are set in motion by his experiments will doubtless evolve a scheme by which the cost of the forms will be materially reduced, and the time required for construction greatly shortened.

I give below a detailed estimate of the probable minimum cost of the proposed cement house. It will be observed that in the allowance for interest and depreciation, I have assumed that 24 houses could be built from one set of moulds per annum, and have made no allowance for general expense or contingencies. The fixed expense for labor and organization has also been neglected during the time between the pouring of the concrete and the removal of the moulds.

ESTIMATED MINIMUM COST OF HOUSE.

Cellar excavation, 250 c.y. at 30c.....	\$ 75.00
Concrete, 200 c.y. 1 3-5 mixture	
Cement—206 bbls. at \$1.50 (net)	309.00
Sand—94 c.y. at \$0.65	61.00
Stone—156 c.y. at \$1.50	234.00
Cost of mixing and placing same at 50c.....	100.00
Steel reinforcement, 10,000 lbs. at 3c.....	300.00
Forms, erection and taking down, approximately 20,000 sq. ft., 225 tons at \$2.00	450.00
Transportation (short haul by team) of moulds, and plant including installation of latter ..	125.00
Plumbing and heating (reported bid)	175.00
Windows, doors, and wood trim including paint	250.00
Fixtures,	50.00
Total cost, labor and material	
	\$2,129.00
Moulds and plant estimated cost \$40,000 (Edison)	
Allow 20 per cent. int. and depreciation divid- ed among 24 houses	333.00
Total cost	
	\$2,462.00
N.B.—No allowance made for general expense or contingencies.	

THE PRACTICAL PROBLEMS INVOLVED By Percy H. Wilson

It was the writer's privilege to visit the laboratory of Mr. Thomas A. Edison, in company with Mr. E. S. Larned, on behalf of Cement Age, for the purpose of seeing his new cement house.

In describing Mr. Edison's idea the writer proposes to confine his discussion of the subject to practical engineering and the structural difficulties encountered.

In order to effect the greatest saving in cost, speed in the actual work of construction, and the designing of a set of forms built of such a material that could be used many times, with little wear and little or no repair, the use of metal was decided upon. The using of metal for forms is not a new idea, although the practice has been limited very generally to concrete chimneys. The concrete chimney forms were of boiler iron, braced with L's and were easily put out of shape, and were unsat-

isfactory in other ways. The use of milled castings for forms overcomes the above objections, and furnishes almost an ideal form from the point of wear and repair. Their rigidity, a point of absolute necessity in concrete construction work, depends only upon the thickness of the casting.

The placing of all the concrete at once, was naturally a result to be obtained, if possible. The theory of placing concrete in layers of six inches, or a foot, has long since been considered unnecessary, but never before has the possibility of placing the concrete in an entire house, in a single day, been contemplated.

Originally Mr. Edison says his idea was to treat the house as a casting made of concrete. In making good castings, the moulds must be perfect, the material from which the casting is made must be brought to perfect fluid state, and adequate arrangements must be made to get rid of the air.

The use of cast iron forms solved the question of mould. The next question was to bring the mixture of water, cement, sand and stone to as nearly a perfect fluid state as is possible. In order to accomplish this a colloid was used, namely, clay. Mr. Edison's experiments lead one to believe that the use of this colloid will at least insure the running of the mixture to all parts of the forms, and there will be no voids. Thejection of the air could be accomplished in several ways, but the giving to the floor a slight camber, with a blow hole at the highest point, seems to be the most feasible. With the mass flowing into every part of the forms, due to the use of the colloid, the next question is, will the mass disintegrate, due to the obstruction to free flow presented by the reinforcement and the necessary plumbing and heating pipes and to the action of gravity?

The restriction of flow due to the reinforcing, etc., will be more serious the larger the size of the stone used. If $\frac{1}{2}$ inch were used, there would probably be no appreciable resistance. No doubt where the reinforcing crosses, or is spliced, the larger stones will collect, one stone being added at a time, but this will be very much like floating sheet ice in a river, held by a group of piles. The first piece sticks, then another and another, until finally so much is added to the stationary pile that the whole is caught by the passing current or the floating ice, and is swept away by the tide.

The settling of the larger and heavier particles in the concrete to the bottom, due to the action of gravity, depends more upon the disturbance of the mass after it is in place and also the speed with which the concrete gets its initial set, than upon the action of gravity alone. There will be no settling of stone to the bottom of the forms after the cement has taken its initial set. And the important point to determine is, as to how the mass of concrete flows into the floor forms. Concrete certainly has an angle of repose and the question is what this will be. Will the concrete, upon being placed, spread in a thin layer, say one inch thick, over the whole area of floor forms? If so, there will surely be a settling of the larger particles to the bottom of the floor. Or will it fill the forms from top to bottom, and be gradually worked from the sides by the pressure of the head of concrete in the side walls assuming an angle of repose of say 30 degrees? This would seem to depend upon the amount of water used and Mr. Edison emphasized the fact that just the proper quantity of water must be used. In experimenting, a box with one glass side would seem to afford one an opportunity of observing the physical action of the concrete while being placed. In a sea wall at Annapolis the writer's firm placed concrete in water to a depth of five feet, same being placed by starting at one end of the forms and working longitudinally along the wall toward the other end. The concrete was mixed wet and in placing, was brought to the elevation of the surface of the water, in the meantime being allowed to as-

*This Mr. Edison answers with the statement that the brackets can overflow. The elevator has a back to permit spills to flow back to the reservoir.

**Assoc. M. Am. Soc. C.E.

same a natural angle of repose in the forms. In spite of the fact that an immense excess of water was used, the concrete assumed an angle of repose of about 30 degrees, and no difficulty was experienced on account of stones separating from the mass and rolling down the slope to the bottom of the form. The wall was afterwards examined by a diver, and no disintegration of material could be observed. A 13-5 mixture was used with run of crusher stone 2 inches and under.

That the addition of clay, the necessary colloid weakens the concrete, seems to be the disputed question. Tests made sometime ago would seem to show that by the addition of a small amount, the strength of the concrete is not affected. Its addition will, however, slow up its setting, but at worst will only postpone the time of the removal of the forms. Mr. Edison's latest experiment, which is being tried at the present time, contemplates putting the concrete through a vertical 4-inch box 10 feet long, and then through a horizontal box about 5 feet, long up through a vertical box 5 feet long, then another horizontal reach of 5 feet, then through a vertical drop of 5 feet, and then another horizontal reach of from 3 to 5 feet and finally up a vertical reach as far as the cement will flow. Of course the head in the original vertical reach has something to do with the distance through which the concrete can be forced, but if the experiment is successful engineers will be convinced that Mr. Edison has at least discovered a way to make concrete an almost perfect fluid.

SIZE OF PLANT WOULD VARY.

Briefly referring to the plant necessary, every contractor would have ideas of his own as to the amount of plant and the exact way in which the same should be utilized, experience very largely dictating to the contractor which particular class of plant could be most economically operated by him. It would seem that a practical man would probably reduce rather than increase the amount of plant suggested by Mr. Edison. This of course would lessen the cost of the house as regards the item of interest on the investment and depreciation of the plant.

MR. EDISON'S EXPERIMENTS REVIEWED.

To give a brief resume, Mr. Edison seems to have conclusively proved, (1) that a house can be built in the way he states; (2) that every practical construction problem involved can be solved; (3) that a mixture of concrete can be obtained which will insure its flowing to all parts of the forms thus avoiding voids.

His experiments have not gone far enough as yet to definitely determine the following:

First: Does the addition of the necessary colloid delay the setting of the concrete, or affect its strength?

Second: Will the stone separate from the sand and cement and form a non-uniform mass either in placing, or at a later period, due to the action of the laws of gravity?

The first of these items very naturally affects only the cost of the building. The second affects its stability and must be solved definitely before the building of a house in this way can be successfully accomplished.

On the whole the idea is one of rather revolutionary type in engineering construction, but judging from what Mr. Edison has already accomplished toward the solving of the practical difficulties which have arisen, it is likely that he will in the end be successful in building a house in the way he has planned.

Relative to the cost of the concrete house the writer has made an estimate and agrees practically with Mr. Larned's estimate, as above.

ONTARIO'S BUILDING STATISTICS--Report of Labor Bureau Shows Unprecedented Activity in Building Operations.

SOME INTERESTING FIGURES regarding the growth of Ontario during 1906 have been gathered by the Provincial Bureau of Labor and published in its eighth annual report which has recently been issued. These figures are particularly attractive as in a way they measure the prosperity which the Province has been enjoying. Moreover, they point to the extent to which Ontario is becoming populated and express the confidence of the people in the stability and future of not only the Province, but the country at large as well.

Returns from 559 municipal clerks give the amount spent by Ontario on new buildings in the above year, as \$34,644,109. Besides this sum, \$4,108,626 was spent on permanent improvements such as bridges, roads, sidewalks, etc., and \$1,046,581 was used for better sanitation, including new sewerage.

Over 14,733 new buildings were erected. According to the summary, the eighteen cities of the Province report 9,460 new buildings costing \$23,592,934, and permanent improvements and sanitation amounting to \$2,243,441 and \$654,116 respectively. In 106 towns reporting, twelve not doing so, \$7,382,625 was spent on 2,262 new buildings, \$1,037,750 on permanent improvements and \$372,306 on sanitation, leaving for the 394 incorporated villages and townships which have made returns, 2,608 new buildings aggregating in cost \$3,668,550, together with permanent improvement amounting to \$827,435, and new sewerage, etc., costing \$20,159.

Four cities, namely, Fort William, London, Ottawa and Port Arthur, each went over the million mark in building operations alone. Hamilton had over two million to her credit, while Toronto reached the high water level with a grand total of \$13,160,398. The figures for the first five named cities are: Fort William, 2,674 buildings; London, 320 buildings; Ottawa, 362 buildings; Port Arthur, 293 buildings, and Hamilton, 697 buildings; aggregating in cost \$1,079,740, \$1,080,000, \$1,728,975, \$1,598,260 and \$2,124,815 respectively.

These cities also expended the following amounts for permanent improvement and sanitation: Fort William, permanent improvement, \$246,600, sanitation, \$185,000; London, permanent improvement, \$123,345, sanitation, \$20,575; Ottawa, permanent improvement \$207,150, sanitation \$30,342; Port Arthur, permanent improvement \$88,211, sanitation \$205,833; Hamilton, permanent improvement \$71,664, sanitation \$38,173. Toronto's expenditure in the foregoing work was \$980,893 and \$63,257 respectively.

In the average cost of buildings, Port Arthur leads at \$5,454, Ottawa is second at \$4,776; while the averages of Toronto, London and Hamilton are \$3,797, \$3,371, \$3,048 in order named.

Averages of these dimensions speak well of the character of buildings which are being constructed in our principal cities, showing as they do, a trend towards a more substantial class of structures.

Toronto Junction (now West Toronto) is another place that made a splendid showing, as in the year mentioned 267 new buildings were erected at an aggregate cost of \$1,086,000. In its entirety the report compiled from municipal statistics by the Bureau of Labor speaks well for the accomplishments of Ontario. However, it is expected that this department's summary for 1907 will eclipse all previous records as last year was an exceedingly busy one throughout the Province, and Toronto by itself looms up with no less than 5,051 permits for work carried on at a grand total of \$14,325,800.

QUEBEC BRIDGE REPORT CONCLUDED---Remaining Seven Appendices Laid before Parliament.---Masterful in Detail, but Weak in Positive Conclusions.---Important Features Treated. . . .

THE REMAINING seven appendices to the report of the Quebec Bridge Commission have been submitted to Parliament and in all the mass of technical discussion that treats so thoroughly and masterfully with every detail of the design, construction, fall and condition of the fallen members of the ill fated structure as well as the theories and principles evolved, this, the latter portion of the lengthy report fails to give any more definite conclusions as to the direct responsibility for the disaster than the first part of the report promised.

DESCRIPTION OF FALLEN STRUCTURE.

In appendix 12 in which a description of the fallen structure is given the commission describes the fall of the bridge as follows:

"We are satisfied that the structure was being closely watched and that had there been noticeable weakness at any points it would have been detected and recorded. There is no evidence of the existence of weak details except on the lower chord.

"We therefore conclude both from the evidence of the witnesses, and from that of the wreckage, that the initial failure occurred in chords 9-R and 9-L, anchor arm.

"Our opinion is that these two chords failed almost simultaneously by rupture of laticing or shearing of lattice rivets, and that the buckling of the ribs followed immediately. The cantilever arm commenced to drop, turning around the feet of the center posts, and raising the anchor arm apparently fell faster than the left truss, top of the center post had leaned over perhaps 30 ft. (this estimate being made by the witness Chase) the center post feet kicked off the pedestals, and both anchor and cantilever arms crashed down. The right truss of the anchor arm apparently fell faster than the left truss, for the top members of the arm have fallen towards the right, and the witness Delphis Lajeunesse noticed such a movement. The stub chords on the cantilever side which were attached to the center post feet struck the coping of the masonry heavily, the marks of the contact on these chords indicating that the right post was falling the faster. The cantilever arm was controlled in its fall by the stiffness of the center post, and by the resistance of the upper chord, and did not drop suddenly until the feet of the center posts kicked off the pier. The center post feet reached the ground first; carrying inwards before them the lower parts of panels 9 and 10 anchor arm; the remainder of the anchor arm was swung forward by the action of the upper chord in straightening out, under the pull of the cantilever arm, and moved around the top of the anchor pier as a fixed point. The damage to the lower chords from the fall was the more severe because the ends of the posts landed in the foundation pits dug for the falsework, and the chords themselves struck on the high ground between the pits. The forces that pushed the center post feet out into their present position, as described by Mr. Kinloch, are a matter of conjecture; the holes dug by the feet in their fall are plain to view and are partly filled by sections 5 of the center posts which are standing upright in them. As these sections are comparatively little injured and have not dug down into the ground, it is evident that they struck with but little force and that the ground was already shaped to receive them. The force of the fall was probably largely absorbed in the wrecking of sections 6 of the center posts."

LACK OF CAPITAL INVITED DISASTER.

The commission in appendix 18 strongly criticizes the lack of capital for the successful carrying out of the project and the faulty specifications as approved by the Dominion Government. It says in part:

"The Quebec Bridge was designed to meet the requirements of the specifications approved by the Dominion Government in 1898 and amended in 1903. The method adopted by the company to procure tenders was to issue a general specification and to call upon contractors to prepare plans in accordance therewith.

"Considering all the conditions pertaining to the undertaking, the adoption of this method was not in the best interests of the work. The company was known not to have the capital necessary to proceed immediately with construction, and the preparation of complete preliminary plans would involve a large outlay. The evidence and documents show that the preliminary plans submitted with the tenders were incomplete; this was as might have been expected, as the several contractors who tendered for the work had little assurance that they would get any return for their expenditure of time and money.

"All error of judgment made by the Quebec Bridge Company was the selecting of an engineer who did not possess the necessary special knowledge and experience to prepare the specification. It is true that this specification was considered to be only tentative, drawn up for the purpose of procuring preliminary tenders, but its history and importance cannot be overlooked. It became the basis of the contracts between the Quebec Bridge Co. and its contractors, was approved by the Government engineers, and was an essential part of the subsidy agreement whereby the Dominion Government undertook to pay the Quebec Bridge Co. on certain conditions one million dollars.

"The specification itself, herein called the 1898 specification, was for the most part a copy of a specification issued by the Department of Railways and Canals in 1896; there is nothing in its wording to indicate that the Quebec Bridge was an exceptional structure and without precedent or that the propriety of applying to this structure other than the usual clauses in bridge specifications was carefully considered."

FORTH BRIDGE SHOULD HAVE BEEN STUDIED.

In the same appendix the commission regrets that the achievements of the designers of the Forth bridge were not more closely studied by engineers on this continent. In this connection the report says:

"The Forth bridge was built on the system not suited to established American methods of bridge construction, so that its distinctive features of design, construction and erection were not followed. It is proper to add that the achievements of the Forth bridge engineers deserve much closer study than appears to have been given to them on this continent. Messrs. Baker & Fowler succeeded in erecting a structure which weighs considerably less per lineal foot than the Quebec bridge and which is designed to carry about one-half the rolling load and several times the wind load specified for the Quebec bridge. The main compression chords of the two bridges are of practically equal area but the material in the Forth bridge is of a considerably higher ultimate strength than that used in the Quebec bridge, the unit stresses are less and the design of the cross section of the chords is such that they should be able to carry

greater unit stress with safety. On great bridges these are factors to be observed, and it is to be regretted that the stress sheets and full engineering studies in connection with the Forth bridge have not been published.

"It is evident that the designers of the Quebec bridge were compelled to work from experience gained on much smaller bridges."

COMPARISON WITH OTHER LARGE CANTILEVERS.---Appendix 17 Most Interesting in the Comparative Figures Given, Showing the Relative Size and Strength of Important Members of the Several Bridges.

ONE of the most interesting appendices to the report is that giving a comparison of the design for certain chords of the Quebec bridge with those for similar members of other great cantilever bridges, for this reason we give appendix 17, in full.

"The outlines of six great cantilever bridges are shown on drawings 31 and 32 (not reproduced), and detail plans of the lower chord construction adopted for each bridge, on drawings 34, 35 and 36 (not reproduced). The position of the chord selected is shown in each case on the outline drawings, except for the Forth bridge; the detail drawing for this bridge is simply a sketch plan showing the general make-up of the main compression members.

"In the attached table we introduce for use in comparison, an example giving the dimensions of an ordinary bridge post of the two channel type, the figures being taken from Professor Burr's 'Elasticity and Resistance of the Materials of Engineering.' These dimensions are more or less typical of those latticed columns that have been used in bridge construction with such success during the last twenty-five years; the details of such columns are now designed entirely by practical rules.

"It will be noted that the Forth bridge chord is in a class by itself. It is not a latticed section, but may be regarded as a solid section built up out of separate plates. No criticism touching the practical success of this design has ever been made, but it is not a class of construction that could be adopted by an American bridge company without making material changes in its shop equipment and methods of handling its business.

"We have, however, noted in Appendix No. 18 that the work of the Forth bridge designers is worthy of careful study.

"The examples taken from American practice may be divided into three groups:

- (1) Chords of the ordinary two channel type which reaches its maximum development in the Monongahela design.
- (2) Chords of the four channel type latticed into one column as adopted for the Memphis and Quebec bridges.
- (3) Chords of the four channel type latticed into two columns, which are made to act together by means of tie-plate connections.

"This type was adopted for the Thebes and Blackwell's Island bridges.

"In the accompanying table we give the principal dimensions of the chords shown on the drawings.

"It is almost impossible to find any common basis for a comparison of these chords. It must be remembered that latticing is often uniform in size in members on the same bridge doing similar service, but having different loads and cross sections. Thus in the Quebec bridge A9L had an area of 781 sq. in. and A1L an area of 301 sq. in., yet both members had about the same outside dimensions in cross-section and the same latticing. Therefore as the chords selected for the drawings are not the most heavily stressed chords in the respective bridges, comparison by proportion of lattice to main sections would be unfair. In fact we may say that the drawings given are only typical.

"A theoretical comparison between the lattice systems of the different columns might be made by using any one of the various formulas given in appendix 16, but we have already pointed out that no one of these formulas is generally accepted by the profession. There are so many causes of variation in the strength of built-up chords of equal area which are not provided for in these formulas, that comparison by calculation does not appear to be satisfactory.

"Referring to the table, it will be noted that the Quebec chord has considerably less horizontal stiffness (see values of l/r), less lattice area, less rivet area, and less splice plate area in proportion to the size of the members than any of the earlier bridges. It should be remembered, also, that the unit stresses for the Quebec bridge were higher than those of the earlier bridges. It will be noted that the earlier designers considerably overran the 15 or 20 per cent. of splice plate area. This is also true of the Quebec bridge chords, but not to the same extent. Mr. Szlapka states that splice plates having an area of cross section equal to 15 per cent. or 20 per cent. of the cross section of the member would be satisfactory.

"The development of the detail plans of the Blackwell's Island bridge was contemporaneous with that of the Quebec bridge plans; the Quebec designers had not access to the Blackwell's Island plans. In fairness to the Quebec bridge designers, however, it should be pointed out that in the Blackwell's Island bridge the proportions of many of the details are much more nearly in accord with the Quebec bridge practice than are those of the earlier bridges, although the principles of the designs are very different.

"A consideration of the difference in the designs on drawings 34, 35 and 36, all of which have been prepared under the direction of engineers of recognized ability and high professional standing, shows that there is as yet no established system of design for large compression members. The individual judgment of the engineer is the determining factor and this may prove to be erroneous, as it did in the case of the Quebec bridge.

(Concluded on page 72.)

TABLE OF CHORD DETAILS PREPARED FROM DRAWINGS 34, 35 AND 36, REPORT OF ROYAL COMMISSION ON QUEBEC BRIDGE FAILURE.

Bridge.	Area of cross section		Area of rivets connecting lattices cut by section to outside web (one end only).		Length of chord = l .		l/r	Weight of plain section per lin. ft.		Weight of latticing per lin. ft. of chord.	Depth of chord back to back of web angles.	Width of chord out to out of web plates.	Section of horizontal splice plates.		Section of vertical splice plates.	
	sq. in.	sq. in.	sq. in.	sq. in.	ft.	in.		lb.	lb.				ft. in.	ft. in.	sq. in.	sq. in.
Quebec	781	10	4.8	57	0 9-32	19.6	35	2603	66	4 4 1/2	4 9 1/2	68	212			
Memphis	213	10	4.8	28	2 1/2	14.8	18	710	14	3 2 1/2	3 2	46	230			
Blackwell's Island	352	15	4.8	31	1 1/2	22	17	2440	14	4 0 1/2	5 2 1/2	80	387			
Thebes	189	11 1/2	4.8	30	6 5-32	20.1	18	639	7 1/2	3 0 1/2	4 4 1/2	80	70			
Monongahela	262	14 1/2	7.2	30	6 1-32	25.4	14	873	82	8 0 1/2	4 1	74	164			
"Burr"	35	3 1/2	1.2	45	0	6.5	83	118	20	1 6	1 0 1/2					

NOTE—The horizontal stiffness of the inside ribs of the Quebec Bridge chords is less than that of the outside ribs, which is not the case in any of the chords of the other bridges

ESSENTIALS IN DECORATIVE ART.---Design and Selection of Furniture, Hangings and Carpets Important in a Well Appointed Room.---Comments on the Interior of a Modern Club Building.

INTERIOR decoration is a problem which often requires as much study and thought as does the design and plan of a building itself. In a building in which discriminating taste is sought, the services of the decorator are quite as much in demand, and considered equally as important, as are those of the architect.

The color scheme, furniture, hangings and carpet are all to be taken into consideration in a well appointed room, and if one of these essentials is lacking in any particular, the general expression usually falls flat. It is, therefore, quite important that everything should be selected with the greatest care, as the furnishings of a room should unmistakably define the purpose for which it is to be used. Taste and elegance should be the keynote of the general scheme, and tawdriness is to be carefully avoided.

Specially designed and constructed furniture and specially woven carpet, as well as draperies and curtains especially made for some particular room, is often quite necessary in order to bring out the proper effect. It is the lines of the furniture, and the style of the draperies, etc., which reflect the character of the room, just the same as the lines of a building give expression to the exterior and render it either attractive or vulgar.

An excellent idea as to what has been attained in the way of interior decoration is to be found in the National Club, Toronto, where every detail has been carefully worked out. The rooms are rich in effect and permanent in character. While an atmosphere of club life prevails, the whole presents a decidedly inviting and homelike aspect. The carpets are beautiful in their tones; the draperies and portieres are luxurious in character, and the furniture is specially constructed for the comfort of the members and the carrying out of the general effect.

The visitors' and lower members' room on the ground floor and the ladies' reception hall are covered with famous Donegal hand tufted carpets, which were specially made for the Club, the one in the ladies' reception hall being essentially unique in that it is circular in shape.

In the main club room and on the main staircase are Scotch Axminsters, which are also of special make. The club dining-room is carpeted with a crimson Saxony Wilton having a Tudor rose design, which is a reproduction of a carpet first made for Windsor Castle for Her Majesty the late Queen Victoria.

A special quality of Wilton, designed in French Renaissance and very fine in color, is used in the sitting room, library, ladies' dining-room and lounging room, while the private dining-rooms are carpeted with English Axminster, rich in effect. In the billiard room is a special colored composition known as cork carpet.

The main hall of the top floor is covered with a heavy Axbury in a rich Oriental design, and the different bedrooms opening off this hall are carpeted in two-tone Wilton, green and crimson predominating. All of these rooms are rendered cheerful and inviting in character by a treatment of simple wall paper, and printed linen curtains which are washable and therefore very sanitary.

The furniture and draperies throughout the Club proper are especially worthy of note, as they have been selected with a view of producing richness of effect and yet a fulness of character, something significant of the purpose for which the building is used. How admirably every detail has been carried out can only be appreciated by a visit to the Club. Every appointment is perfect. The atmosphere of the Club life prevails, still the general scheme is pleasing and homelike in character.

The furniture is made especially strong for club purposes. The Chesterfield sofas and lounging chairs are exceptionally luxurious, as are the fireside easy chairs, all of which are upholstered in the finest leather and stuffed with curled horsehair. The table and the chairs in the

Board Room are of solid mahogany, the table being of special design, while the chairs are upholstered in the finest hand buffed leather. In the club room on the ground floor the large writing table is also of solid mahogany. All the dining-room tables are of highly polished natural oak.

Three big mahogany arm chairs with the club's crest artistically carved at the top of the backs, have been provided. Two of them are in the reception room, while the third has been placed in the board room. The draperies throughout are mostly made of Utrecht velvet trimmed with very handsome antique

metal galloon applique. These are of a beautiful texture and they lend a refined air and charm to the surroundings. In furnishing these rooms, the effect sought was that of richness and durability, and this has been admirably worked out by the decorators in the sturdy construction of the furniture and the heavy hangings.

The ladies' quarters, however, present a different effect. Here the draperies and furniture are much lighter and daintier than those found in the other rooms, and here, again, the same exquisite taste in the matter of furnishings is carried throughout.

The furniture, carpets, draperies for the entire club, with the exception of the bedroom furniture and dining-room chairs, were furnished by the John Kay Company, Limited, 36-38 King street west, Toronto. All the furniture is hand-made and was turned out in the company's shops especially for this building. This concern employs a large staff of artisans, has its own workshops and decorative department, and carries one of the finest and largest displays of furniture, carpets and draperies in Canada.



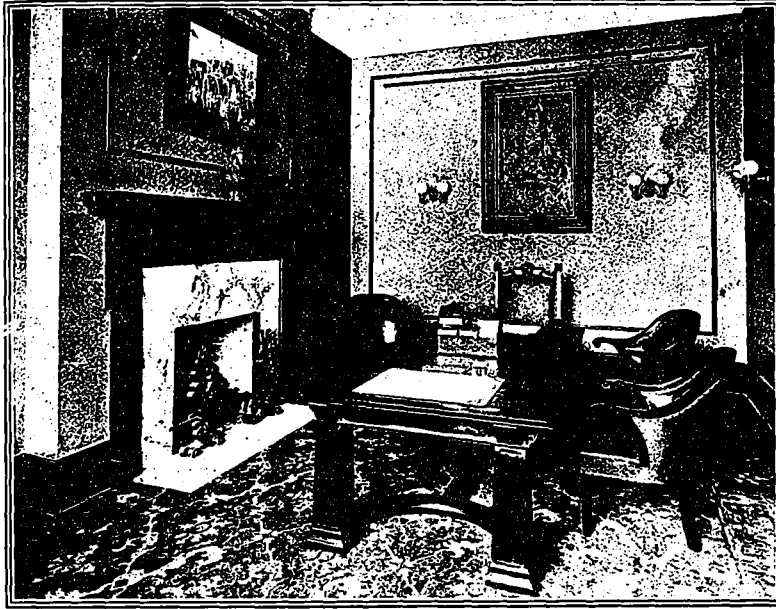
MAIN SMOKING ROOM, NATIONAL CLUB BUILDING, TORONTO, SHOWING THE LEATHER UPHOLSTERED CHESTERFIELD SOFAS AND LOUNGING CHAIRS WHICH WERE SPECIALLY MADE FOR THIS ROOM.

The excellent manner in which every detail has been considered in working out the general interior scheme of the National Club demonstrates fully how well prepared this firm is to fulfil orders for interior decorations and

placed on purpose to cause the nudity of the rest to be more sensibly felt.

The second kind of concord of which we have spoken, and which we termed agreement in taste and style, depends upon the union of the arts among themselves. It exacts from the artist a practical knowledge and habitual exercise of all those other arts that contribute to the embellishment of architecture. In edifices it produces that identity of character and that unity of style and manner which give to the erection the appearance of having been the work of one man, and which leaves room for doubting from the air of similitude which reigns between the decoration and the construction whether the decorator was the architect or the architect the decorator. This perfection is to be met with in the fine works of the ancients. As the arts were then united among themselves, so one was scarcely ever followed to the exclusion of the others; whether the architect executed all the parts of an edifice, or whether he confided their execution to co-operators, one understanding alone always presided over the construction of the work, and, as one mind had directed the whole, the effect was single and the impression undivided.

With the moderns it is not thus; every art in its practice is isolated from the rest. Architecture in particular must lose by this system. From it proceeds those dissimilarities often apparent in many edifices.

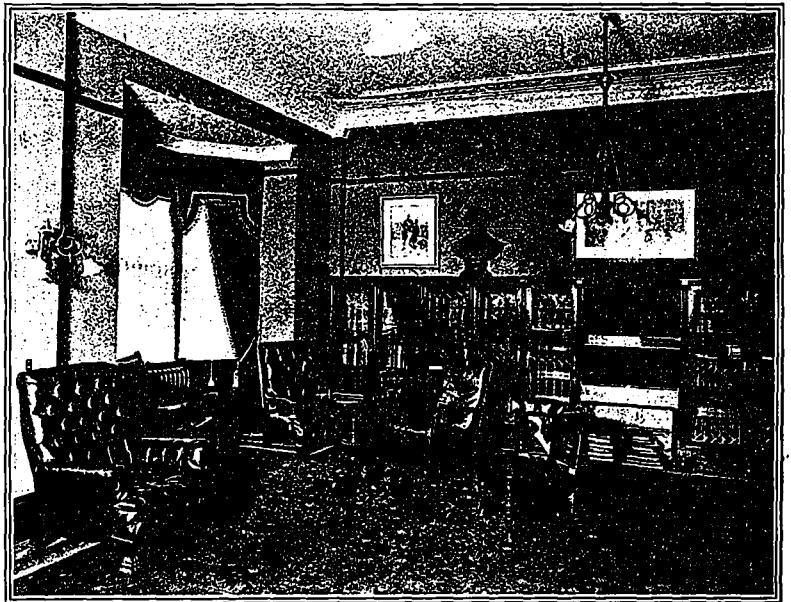


BOARD ROOM, NATIONAL CLUB BUILDING, TORONTO, SHOWING SPECIALLY DESIGNED MAHOGANY TABLE, TOGETHER WITH THE COMFORTABLE ARMED CHAIRS UPHOLSTERED IN HAND BUFFED LEATHER.

furnishings, and it should be particularly pleasing to architects to know that they can enlist the services of so reliable a firm, which is capable of executing their details in work of this character in a highly creditable manner.

HARMONY IN ARCHITECTURE

HERE are two sorts of harmony or concord in architecture. The first signifies agreement in composition, the other in taste and style. There can be no concord in the plan of a building when the interior is after one fashion and the exterior after another. There can be no concord in the elevation of a church which has several orders arranged on its frontispiece, while the inside can only allow of one. There can be no concord in the decoration of a palace the front of which is ornamented with columns that are often useless, and the details of which present, by their over-simplicity, a glaring contrast between the florid and the mean. This want of concord, explains a writer in one of our foreign exchanges, is very remarkable in many of the most important modern monuments of art, where the columns only appear like ornamental excrescences,



LIBRARY AND SILENCE ROOM, NATIONAL CLUB BUILDING, TORONTO. THE BOOKCASES WERE MADE TO ORDER, AND THE HEAVY DRAPERY OVER THE WINDOW IS OF PLAIN RICH VELOUR TRIMMED WITH ANTIQUE METAL GALLOON APPLIQUE.

HISTORY OF THE STEAM LOOP---A Short Review of its Conception by the Inventor, Showing the Practical Application of the Loop and the Conditions Which Led up to its Discovery. . . .

THE Steam Loop is a device for returning the water of condensation from a heating system, located below the water level of the boiler, directly back into the boiler without in any way opening to the atmosphere.

Under favorable conditions the steam loop will work as well as though the heating system were placed high enough above the water level in the boiler to permit all the water of condensation to gravitate back into the boiler.

In a general way the mode of operation of the loop is this: The heating system is so arranged that the water of condensation from the different radiators gravitates towards some low point and thence is led into the top of a receiver. After this is done it is found that owing to friction, caused by the velocity of the steam passing through the different pipes and condensation due to radiation, the steam pressure in the small drip receiver is much less than that in the boiler. This difference will determine the height, or the length of the loop, that must be employed so that the water will gravitate through it into the boiler; that is to say, if there is ten pounds difference in pressure, the descending leg of the loop should extend about thirty feet above the water-level in the boiler, since a column of water two and three-tenths of a foot high is equal to one pound pressure, and, given a difference in pressure of ten pounds, it would require a column of water twenty-three feet high to equal this difference in pressure. If we make the loop thirty feet high we shall have an additional length of seven feet with which to overcome friction. The water, after it reaches the top of the loop, composed of a larger section of pipe, will flow into the boiler through the descending leg with a velocity due to the extra seven feet added to the discharging leg.

Some of the steam loops that have been in use were constructed similar to the sketch, Fig. 1. This style of steam loop was brought to the attention of the public about 1890. In the loop shown in the cut it is not necessary to use a receiver to contain the water from many radiators, as there is only one shown.

Referring to the cut: 1, is the boiler; 2, the radiator; 3, the drip pipe from the radiator; 4, the return leg; 5, a short piece of pipe larger than the receiving or discharging leg, which forms the receiver, or separator; 6 is the main steam pipe for supplying the system; 7 is a check valve opening towards the boiler to prevent the water returning to the system; 8 and 9 are hand valves used on occasions that will be explained later.

OPERATION OF LOOP.

To start the loop in operation with steam in the boiler, we first open steam hand valve 9 to admit steam into the radiator, then open steam hand-valve 8 that opens to the atmosphere and the steam entering the radiator will displace the air and water from the radiator up through the drip pipe 3 into the top side of the large

pipe 5, and so on down through the discharging leg 4 that leads from the bottom of the large pipe 5 and so on through the hand-valve 8 to the atmosphere. When the air and first water have been removed from the system, close the hand-valve 8 and after the discharging leg of the loop has become nearly full of the water of condensation, the circulation will continue through the check-valve 7 into the boiler. This circulation will continue so long as there is no air or an unusual flood of water, for when this happens, pipe 3 will fill solid with water. Under these conditions pipes 3 and 4 (the two legs of the loop) are equal, one balancing the other, and the circulation stops until the equilibrium is displaced by blowing through as has been before described.

During the year 1870 the proprietors of the Townsend works at Albany, N. Y., deemed it best to remove their establishment down to the river front. I concluded to use the exhaust steam for heating the foundry and part of the upper floors, and to heat the offices, machine and pattern shops with direct steam taken from a boiler to be specially installed for that purpose. I in-

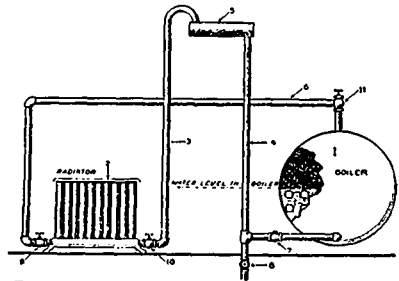


Fig. 1—EXPLAINING THE VARIOUS CONNECTIONS AND THE PRINCIPLE ON WHICH THE STEAM LOOP OPERATES.

tended that the boiler should be set in a pit so that the water of condensation from the heating system of the lower floors would gravitate into it. I did not discover the gross error I had made until after nearly all the work was done, with the exception of the setting of the boiler, when I learned how impracticable it was to place the boiler low enough to have the water from the lower floors gravitate into it owing to the fact that each tide caused the level of the water in the river to rise higher than the fire box of the boiler. In order to overcome this condition it would be necessary to set the boiler in a tank anchored to prevent its floating. This would have been very expensive and under the circumstances impossible.

While working on this problem, it occurred to me that after all the coils and radiators were only a part of the direct steam pipe that conveyed the steam from

the boiler through them and finally terminated in the small pipes used for collecting the water of condensation.

ITS FIRST APPLICATION.

If this smaller return pipe were connected, so I reasoned, to the top of a vessel of proper size placed a cer-

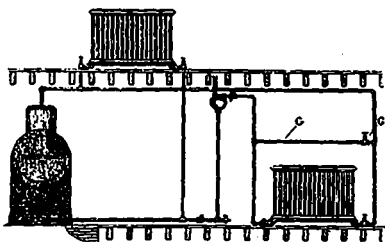


Fig. 2—SHOWING THE BOILER AND SYSTEM OF PIPES AND RADIATORS, A PART OF THE SYSTEM BEING ABOVE THE WATER LEVEL IN THE BOILER AND A PART BELOW IT.

tain distance above the water level of the boiler, the water and steam would pass over into such receiver, the water falling to the bottom and separating itself from the steam. The steam pressure in the receiving vessel would be about the same as the pressure in the system at its farthest point from the boiler. If this pressure were near enough to that in the boiler and the receiver were placed at a height sufficient above the water level in the boiler so that the solid water column would make up for the difference in the pressures, the water would gravitate back into the boiler through a return pipe extending from the bottom of the receiver. With this understanding of the conditions, I prepared a spherical vessel twelve inches in diameter as the receiver to be used in the system with which I was experimenting. I believed that a receiver of the size mentioned would be ample for the purpose, as the capacity was less than one gallon per minute. The receiver was placed on the floor above the boiler where the coils were situated and about nine feet above the water level in the boiler. After the receiver was connected up and steam turned on and the first water and air removed by blowing to the atmosphere, circulation began and was perfectly maintained. This, I believe, was the first steam loop ever made to return the water of condensation from a steam system situated below the water level of the boiler whence the water issued in the form of steam, all without in any way opening to the atmosphere.

DEVICE PATENTED.

For a special application of the device patented February 13, 1872, letters patent were granted to me on December 28, 1883. Fig 2 here shown was taken from the patent papers and is a very good representation of the device: It shows a boiler and system of pipes and radiators, a part of the system being above the water level in the boiler and a part below. The water of condensation from the system above the water level of the boiler is arranged so as to gravitate back into the boiler. The other part of the system is on the same level with the boiler, the water being returned to the boiler by means of a special device, covered in the patent re-issued in 1873, the only exception being that instead of blowing out the first water of condensation to start the circulation, an effort is made to save all the water condensed. To this end, it will be noticed, a direct steam pipe is taken from the main steam supply pipe and connected with the top of a spherical receiver. The supply pipe connected with the spherical receiver has attached to it a stop-valve G, operated by hand a few times until the first water of condensation is removed

from the radiators and a circulation established, after which the stop-valve G may be closed and the circulation will continue as long as the steam pressure in the system is kept up.

The reader may be constrained to ask: "What is the difference between the 'steam loop' and the return steam trap? The mode of returning the water is the same in both. Without opening to the atmosphere and without any loss, both return the water of condensation to the boiler whence it issued in the form of steam and at a temperature only a few degrees less than that of the steam itself." In answer it may be said that the only difference between the two methods is in the way in which the equalizing of the pressure for returning the water is accomplished. In the case of the "steam loop," the height of the returning water column must be great enough to make up for any difference in pressure there may be between the boiler and its steam system, e.g., if the difference in the steam pressure between a certain boiler and its system of distribution is ten pounds, the height of the return water column in the steam loop would need to be from twenty-five to forty feet above the water level in the boiler in order to maintain a circulation. With the return trap the difference in pressure is equalized, not by the length of a return water column, but by means of steam taken direct from the trap so high above the water level in the boiler.

DIFFERENT TYPES OF CLOSET BOWLS—Showing Good and Bad Points of Each.

HERE is probably no more important fixture installed in the residence than the water closet, and it is the purpose of this article to describe the different types of fixtures, and to point out the good, and bad points of each.

The hopper, Fig. 1, is known as a tall round flushing rim, and is without a trap; it is placed over a trap in the floor. The large fouling area in this fixture, the impossibility to secure a sufficient flush by means consistent with closet installation, to thoroughly cleanse the hopper and the trap, have long ago condemned it as a sanitary fixture, and it is generally prohibited wherever a sanitary law is in existence.

Fig. 2 is known as an offset washout. This closet is also without trap and is installed over a trap in the floor. This closet is a hopper closet with a pan and its only advantage over a straight hopper, if it has any, is that the pan, and the water retained in the pan, make it possible to flush the solids en masse; the long fouling space between the trap and the pan is the most objectionable feature and the difficulty of flushing the long outlet clean.

Fig. 3 is known in trade parlance as a short hopper and trap. The shortening of the hopper bowl lessened the fouling space and brought water seal closer to the seat. The difficulty of maintaining a tight joint between the earthen bowl and trap and the unsightly appearance lead to the washout closet as shown in Fig. 4. This type is made with both front and back outlet, the front washout type being the most popular—the one shown is a back outlet washout. The objectionable features are the shallowness of water retained in the bowl and the fouling space marked A and B; the liability of the solids being flushed in the trap but not out of it, in which case the offence

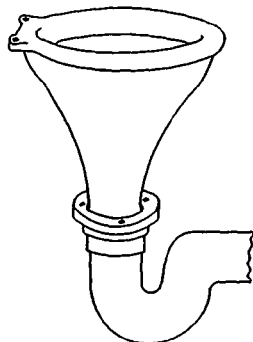


Fig. 1.

impregnates the room, having no provision in this construction to prevent it; then again, the large surface of the closet exposed, makes it a more difficult fixture to thoroughly cleanse by flushing, than those of more modern construction.

The next improvement made is shown in Fig. 5, known as a combined hopper and trap.

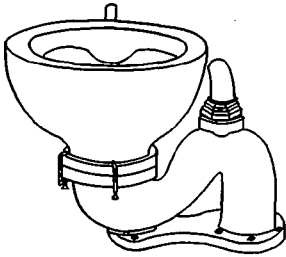


Fig. 2.

This closet corrected the faults of the washout type, inasmuch as it eliminated the fouling space spoken of previously. The objection found in this closet was the difficulty in constructing it so that the solids could be flushed easily and surely with one flush, paper was liable to become caught on projection A, and so retard

the outward flow that a second or third flush was necessary to thoroughly empty the bowl. This has been remedied in some makes and this type of closet, with this projection overcome, is largely used to-day.

The closet shown in Fig. 6 overcomes the defect of the combined hopper and trap, and is known as a syphon acting wash down closet, the outlet leg C being longer than leg D. When the closet is flushed they act as a syphon until the water falls below lip E, the wash down jet F forces a jet of water down the back of the bowl and into the trap, which helps to start the syphonic action, while the combined hopper and trap type has only the restricted flush of water through the flushing rim ports or opening in the run to thoroughly scour the bowl and force the contents of the trap out and into the soil pipe. Fig. 7 is the latest and best closet on the market—the syphon jet type;



Fig. 3.

it is a larger closet than the syphon acting washdown closet, carries a larger water seal, has a stronger syphonic act, due to the jet, which operates as follows: a separate water leg is connected at the top of the bowl at the point where the water enters the bowls and runs down the side of the bowl—(this leg or water channel is perceptible on the side of some types of syphon jets while in others it is not, closets of the latter type are called concealed syphons—the only advantage in appearance and the elimination of all unnecessary crevices or projections which tend to collect dust)—to the bottom of the trap of the closet, entering at point x; when the closet is flushed the jet of water running down this leg is forced through the small opening at x in a small but forcible jet which discharges into the outlet leg, driving the water in A into B, filling outlet leg C. This operation tends to create a

quick syphonic action which sucks out the contents of the bowl and the water discharged through the ports in the flushing rim of the closets, scours the bowl and keeps it clean. This type of closet if properly constructed is practically noiseless. There are a great many different styles made, but in principle they do not differ materially. A syphon jet closet requires

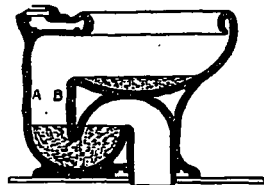


Fig. 4.

more water to flush it than either the washout or syphon acting closet and should always be fitted with a larger tank. The syphon acting closet and the syphon jet closet can be used with a low down tank; when this is done the flush opening into the closet and the connecting pipe should be two inches internal diameter; as a general proposition it takes a better closet to operate successfully on a low down tank than it does on a high tank as the force of the flush is greatly diminished. In selecting a closet, it is well to see them in operation and pains should be taken to select a closet that has a quick and forcible syphonic action.

A good test to ascertain if the flush is sufficient to empty the bowl and make an entire change of water in the bowl and trap is to pour a little ink into the closet. If one flush is sufficient to discharge all of the colored water and replace it with clear, it is reasonably safe to assume that under ordinary circumstances the closet will perform the functions intended. A closet also should be subjected to a paper test by filling the bowl with paper and flushing it to see that it empties quickly and thoroughly without any come back.

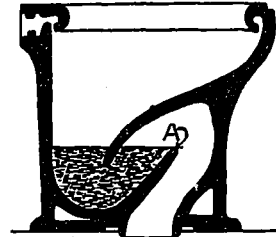


Fig. 5.

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A good test to ascertain if the flush is sufficient to empty the bowl and make an entire change of water in the bowl and trap is to pour a little ink into the closet. If one flush is sufficient to discharge all of the colored water and replace it with clear, it is reasonably safe to assume that under ordinary circumstances the closet will perform the functions intended. A closet also should be subjected to a paper test by filling the bowl with paper and flushing it to see that it empties quickly and thoroughly without any come back.

CONCRETE BLOCK FIRE TEST---Walls Stand Uninjured after Building is Gutted.

A CONCRETE-BLOCK fire test of an exceptional nature was recently afforded by a fire which took place in a three-storey building owned by the Gospel Trumpet Co., of Anderson, Ind. On Dec. 9 the interior of this structure was completely destroyed by a fire started by an incendiary. The building was new, having been completed only about ten days, and was not filled with the contents for which it was intended. This probably did not make the fire so hot as it would have been had the structure been occupied, but on the other hand no water connections had been made and it was difficult to get water on the fire in time to check it to any extent. The interior of the building was completely destroyed, the only thing left standing being a steel beam supported by a steel post. The concrete blocks, however, were not injured, and there is no necessity of rebuilding any portion of the structure in which they were used. Over a few windows where the flames burst forth, it will be necessary to clean the faces of the blocks, but elsewhere they show no signs of any sort of the fire. The blocks were made on a Hercules machine using a very wet mixture, much wetter than

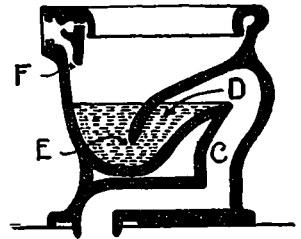


Fig. 6.

is customary to employ in block making. It is considered that the dense texture of the concrete resulting from this procedure was largely influential in producing the excellent showing made by the blocks in this fire.

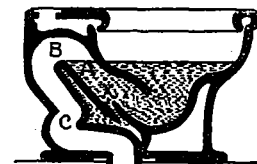


Fig. 7.

PROSPECTIVE CONSTRUCTION

The following information is obtained from our correspondents, from architects, and from local papers. These items appear in our Daily Advance Reports and are herein compiled for the use of subscribers to the monthly issue of "CONSTRUCTION." Should any of our readers desire this information oftener than once a month, upon receipt of request, we will be pleased to submit prices for our Daily Service.

Mills and Factories

Toronto, Ont.—Architects Ellis & Conery, Manning Chambers, Toronto, have awarded the following contracts for the erection of a two storey and basement factory on north side of Queen street, near Jamieson avenue for J. H. Smith, viz.: Plumbing and heating, Maxwell & Johnson, 353 Queen W.; painting and glazing, James Casey, 32 Richmond st. E.; roofing, Asst. Matthews, 256-8 Adelaide st. W.; carpenter work, Smith & McElroy, 208 Close ave.; brick work, Riddell & Bailley, Toronto.

Toronto, Ont.—J. Beck, of Penetang, has made application to Commissioner of Industries Thompson, Toronto, for a site at Ashbridge's Bay, on which to erect a saw mill.

Toronto, Ont.—The Sunbeam Incandescent Lamp Company has secured a site on the east side of Bouverin street, on which it will erect a factory building, at a cost of, approximately, \$75,000. Plans for the structure have been prepared by Architect Herbert, Toronto.

Toronto, Ont.—Mr. Robert Watt, 201 Campbell avenue, will erect a brick building to be used as a planing mill and factory, at the corner of Campbell avenue and Jemison avenue.

Toronto, Ont.—The Bredin Bread Co., has purchased two acres of land on the north side of Bloor street east of Dundas street, on which it will erect a three storey factory, at a cost of \$50,000.

Halliburton, Ont.—Pitt & Co., of Niagara Falls, formerly Pitt & Robinson, 504 Manning Chambers, Toronto, have been awarded the contract for the chemical mills to be erected in Halliburton for the Wood Products Company of Canada, Limited, Toronto. The plant will comprise four buildings, a water tower 75 ft. high, with 50,000 gal. tank on top, and a dam 200 ft. long, all of which will be of concrete construction. Niagara system concrete will be used throughout on this work.

Guelph, Ont.—Mr. Todd, of Walkerton, has bought the property at the head of Paisley street, Guelph, on which he will erect a saw and planing mill of frame construction.

Guelph, Ont.—The City of Guelph proposes to erect a municipal abattoir in the near future.

Guelph, Ont.—The Aspinall Manufacturing Company, of Jackson, Mich., proposes to establish a branch factory in Guelph. The company manufactures potato machinery.

Guelph, Ont.—Engineer Davis has submitted to the Board of Water Commissioners, plans for a 150 horse power boiler, to replace the two boilers now in use.

Niagara Falls, Ont.—The Spirella Company, of Meadville, Pa., has bought a site with 150 ft. frontage on the River road, near the Upper Steel Arch Bridge, Niagara Falls, on which they will erect a factory building for their Canadian branch, which is capitalized at \$50,000. Plans have been prepared by Architect Crompton, Niagara Falls, for a building 32x135 ft. The company expects to employ 100 hands.

Niagara Falls, Ont.—The American Cynaid Company will erect a large plant just west of the Ethnithie factory, at this place. Construction of the building, which will cost, approximately, \$250,000, will be commenced at once. The president of the company is Frank A. Washburn, of New York. Alderman Hanan, Niagara Falls, has been instrumental in inducing this concern to locate here.

Ottawa, Ont.—Odell Bros., Morris & Ballantyne, and T. M. Mulligan, brick companies of Ottawa, have been consolidated into the Peerless Brick and Tile Co., with authorized capital of \$150,000. The new company will erect a large brick plant at the Morris & Ballantyne yards at Billings Bridge. The officers of the company are: W. S. Odell, president; J. A. Ballantyne, vice-president; Messrs. W. D. Morris, T. M. Mulligan and Mortimer Odell, directors.

Ottawa, Ont.—The special committee, consisting of Aldermen Wilson, Farrow, Brown, Lapierre and Little, appointed to consider the desirability of establishing an incinerator plant in Ottawa, has recommended that the council appoint a sub-committee to inspect the Harris Gas Process, at Newark, New Jersey, with a view to establishing a similar gas plant in Ottawa.

Brockville, Ont.—The Stanley factory, five miles from Brockville, has been totally destroyed by fire.

Ridgetown, Ont.—The Canadian Canners Co., have purchased a site of six acres at Ridgetown, on which it will erect a large canning factory. George Arnold, Pelham, is the chief promoter of the enterprise.

St. Catharines, Ont.—The Whitman & Barnes Knife Works has been completely destroyed by fire. The loss, which is approximately \$150,000, is covered by insurance to the extent of \$105,000.

Exeter, Ont.—The Exeter ratepayers have carried two by-laws, authorizing the granting of free sites to the Gibb Evaporator Co., and the Connor Machine Co., upon which new factories will be erected.

St. Thomas, Ont.—John Haynes' anti-meat mill at Bridgen, has been totally destroyed by fire, entailing a loss of \$3,000.

Milton, Ont.—The P. L. Robertson Mfg. Co., Limited, will erect a large factory for the manufacture of screws at Milton, Ont.

Fort Erie, Ont.—Hanna Bros., of Ridgeway, have purchased a site upon which they will erect a planing mill. They have also secured a lease on a portion of the M. C. R. property for a lumber yard and siding. The mill will be of concrete construction, 50x70 ft.

Hightgate, Ont.—D. A. Mackayson's stove mill at Hightgate, has been completely destroyed by fire, at a loss of \$6,500.

Galt, Ont.—Robert Elliott, proprietor of the soap factory, Galt, will erect a two storey solid brick and stone building on Main street. The building will be 50x28 ft., and will be used for factory and warehouse purposes.

Cobalt, Ont.—The machine shop and assay office at the Foster mine have been completely destroyed by fire. Loss \$3,000.

Windsor, Ont.—The Brabant's brass works, of Detroit, propose establishing a branch factory at this place.

Kenora, Ont.—Geo. H. Archibald & Co., Ltd., Union Bank Building, Winnipeg, have been awarded the contract for rebuilding the plant of the Maple Leaf Flour Mills, at Kenora, Ont.

Welland, Ont.—The Remis Company is negotiating for a site in Welland, on which it proposes to erect a \$150,000 cotton mill, in the spring of 1909. Mayne J. H. Crow, Welland, is in correspondence with this firm.

Port Stanley, Ont.—Tenders have been received for the erection of a brick and

concrete building, for the Standard Impalement Company, Limited, at Port Stanley, Ont. Wm. G. Murray, Masonic Temple Building, London, Ont., architect.

Freeman, Ont.—The Glover Basket Factory, at Freeman, near Burlington, will be re-built at once, and it is expected will be in running operation by June 1st. The business will be conducted as a joint stock company, capitalized at \$20,000.

Napanee, Ont.—The large foundry owned by Sir Richard Cartwright, and used as agricultural works by John Hering, Napanee, has been completely destroyed by fire.

Wallaceburg, Ont.—A new flax mill will be erected in Wallaceburg, by Geo. H. Campbell, of the Canada Flax Co., of this place. The building will be equipped with all modern machinery.

Montreal, Que.—The Geo. Hall Coal Company, of Canada, Limited, with a capitalized stock of \$200,000, has acquired from the Dominion Government a site measuring 230 by 500 ft., on the Wellington Basin, near the outlet of the Lachine Canal. It is estimated that the company's plant will cost \$100,000.

Scotstown, Que.—Messrs. Taylor & Jamieson, Scotstown, Que., will rebuild their saw mill, which was destroyed by fire.

St. Lambert, Que.—The Waterman Fountain Pen Company will erect a factory building on St. Denis street, St. Lambert, Que. Architects—Hutchison & Wood, Royal Insurance Building, Montreal, Que. The building will be three storeys in height, of reinforced concrete, and fireproof throughout. The power and heating house will be built separate.

Vancouver, B. C.—Messrs. Foveal & McDonald, have leased 50 feet of the waterfront at the foot of St. George street, Vancouver, on which they propose to erect a large factory.

Vancouver, B. C.—Daniel Wageman, a Los Angeles capitalist, is arranging a deal for 5,000 acres of timber limits on Howe Sound, near Vancouver, for a company of capitalists. The mill will be erected with a capacity of 250,000 feet daily.

Vancouver, B. C.—The Scanlon Brooks Lumber Company, of Minneapolis, is contemplating the erection of a large mill at this place in the near future.

Vancouver, B. C.—The Vancouver Sash and Door Factory has been totally destroyed by fire. Loss, \$30,000, with insurance of \$10,000.

Victoria, B. C.—Plans have been prepared for Ald. W. J. Mable, Victoria, B. C., for the erection of a \$12,000 building, to be used as carriage works.

Victoria, B. C.—Messrs. Cuthbertson & A. A. Joseph, of New Westminster, B. C., are negotiating for a site in Victoria, on which they propose to erect a shingle mill, to be in operation this summer. It is estimated that the building and machinery will cost \$10,500.

Victoria, B. C.—The Victoria Company's brick works, have been destroyed by fire. Loss \$10,000.

Victoria, B. C.—The Victoria Bridge Company will erect a temporary plant to replace the one recently destroyed by fire. The structure will be of corrugated iron and steel frame. J. P. Elford is manager of the company.

Fernie, B. C.—The Fernie Port Steale Brewing Company has awarded to Mr. Stanley, of Spokane, the contract for the erection of a new \$200,000 brewing plant, in Fernie. The building will be of brick construction, 120 frame, 38 ft., four storeys high, and will be fireproof. Plans provide for concrete floors and steel girders.

Sandon, B. C.—Messrs. Taggoad & Fruder's brewery, at Sandon, B. C., has been totally destroyed by fire. Loss \$15,000, half of which is covered by insurance.

Esquimalt, B. C.—A deal is about to be closed between the B. F. Graham Lumber Company, Victoria, B. C., and Seattle and New Mexico capitalists,

whereby the latter will take over the interests of the company, and will in all probability erect a mill, to cost about \$150,000, at Esquimaux, B. C.

Weyburn, Sask.—The Western Fire Clay Products, Limited, with a capital of \$250,000, will erect a large plant at Weyburn, Sask., in the near future.

Regina, Sask.—The city of Regina is contemplating the erection of a cold storage plant. P. McAra, Jr., chairman of the Industries Committee of the Board of Trade, Regina, has been prominent in this movement.

Tantallon, Sask.—A. R. Fleming, a Regina contractor, is endeavoring to organize a company for the purpose of erecting a \$10,000 brick plant on the homestead owned by Mr. Fleming, adjoining the village property, Tantallon, Sask.

Calgary, Alta.—Architects Dowler & Michie, Calgary, are preparing plans for tile works, to be erected at Calgary, for Mr. A. J. McArthur, Crescent Heights, Calgary. Building will be of brick construction, with concrete foundation, steam heating, electric lighting. Following work specified—Floor and wall tile, ornamental terra cotta, and drain tiling.

Gas Plants, Elevators and Warehouses

Toronto, Ont.—The Grand Trunk elevator, at the foot of Spadina avenue, has been completely destroyed by fire. Loss \$81,400; insurance \$81,500.

Toronto, Ont.—Dr. T. A. Slorun, Limited, Toronto, has been granted a permit for the erection of a four storey warehouse at the southeast corner of Spadina avenue and Phoebe street.

Toronto, Ont.—Architects Denison & Stephenson have prepared plans for a large brick and stone warehouse to be erected on Esplanade street, east of Scott street, for Messrs. Everist & Hadcliffe. The building will have a 65 ft. frontage on Esplanade street will be four storeys in height, of mill construction, with foundation of concrete on piles, and will be equipped with two elevators, and a sprinkler system. Estimated cost, \$35,000.

North Toronto, Ont.—The Standard Fuel Company, Toronto, will erect a new building on the old site of the old C. P. R. freight shed.

Fort William, Ont.—The Canadian Pacific Railway will expend the sum of \$500,000 on improvements to elevator D, at Fort William.

Victoria Harbor, Ont.—The Canadian Pacific Railway Company propose to erect at Victoria Harbor, Ont., an elevator of a capacity of \$10,000,000 bushels, to be constructed in five units of 2,000,000 bushels per unit.

Fort William, Ont.—The Grand Trunk Pacific Railway will, this coming summer, erect a large grain elevator at this place.

Chatham, Ont.—G. T. Crown's elevator at Prairie Siding, has been entirely destroyed by fire. Loss, \$17,000, heavily insured.

Goderich, Ont.—At a meeting of the shareholders of the Goderich Elevator & Transit Company, of which John I. A. Hunt, of London, is president, it was decided to erect an extension to the building to double the present capacity. The work will, in all probability, be commenced this fall.

Montreal, Que.—Fraser, Viger & Co., Ltd., Montreal, have purchased the property on Benoit street, on which they propose to erect a large warehouse.

Fairville, N. B.—Architect F. Neil Brodie, 42 Princess street, St. John, N. B., has awarded, to Messrs. B. Mooney & Sons, St. John, a contract for a warehouse to be erected at Fairville, N. B., for Edward Partington Pulp & Paper Co. Building will be of fireproof construction, with concrete foundation and cinder concrete roof.

Campbellton, N. B.—Jones & Schofield, of St. John, have taken a lease on a piece of land near Government wharf, at Campbellton, N. B., on which they will erect a new warehouse.

Winnipeg, Man.—James McDermid Company, Winnipeg, have been awarded the contract for the erection of the Government Examining Warehouse, at the corner of McDermot and Rolle streets, Winnipeg, at contract price of \$276,000. The building is to be six storeys in height, of brick construction, with concrete foundation.

Prince Rupert, B. C.—The firm of Foley, Welch & Stewart, contractors, who have been engaged by the G. T. P.

to carry on work at this place, will erect a warehouse 420 by 60 ft. in dimensions on a site near the wharf.

New Westminster, B. C.—A company, known as the Royal City Gas Improvement Company, has been incorporated, with a capital of \$100,000. The company will either purchase the plant of the present gas company in new Westminster, operated by James Cunningham, or install a new and modern plant of its own.

Saskatoon, Sask.—Soldon & McLaughlin, Saskatoon, propose to erect a new two storey warehouse, on the corner of nineteenth street and Third avenue. Building will be 50 by 50 feet and be built of cement blocks.

Calgary, Alta.—Sir John Langman and his son, A. M. Langman, will erect, in Calgary, a new four storey warehouse, which will cost \$40,000. The structure will be of Calgary stone and brick, and the walls will be strong enough to admit of two additional storeys. Three vaults will be installed.

Electrical Construction

Niagara Falls, Ont.—The Electric Light Committee of the Council, Niagara Falls, has awarded to the Canadian Westinghouse Company, Hamilton, a contract for transformers at \$35 each, and also circuit breaker for amusement park service.

Niagara Falls, Ont.—While making 450 revolutions a minute, under a high speed test, the new 10,000 horse-power electric generator, recently installed by the Niagara Falls Hydraulic Power Company, burst, destroying the generator, which was valued at \$50,000.

Quebec, Que.—R. H. Gale, proprietor of the Slade Electric Company, has been awarded the contract for the electric wiring, fixtures and telephones required in the Mount Carmel street wing of the Chateau Frontenac, Quebec.

Kilnarey, Man.—A by-law will be submitted to the ratepayers of Kilnarey, in the near future, regarding the granting of a franchise to Messrs. Skimmer & Colinson, of Estevan, Sask., for the establishment of an electric lighting plant at this place.

Ladysmith, B. C.—A by-law will be submitted to the ratepayers of Ladysmith, B. C., for the purpose of authorizing the expenditure of \$25,000 for the installation of a electric lighting plant at this place.

Neelson, B. C.—The City Power and Light Sub-station has been badly damaged by fire. The building was occupied jointly by the city, the West Kootenay Power and Light Company, and the Neelson Tramway Company. The loss of the Power & Light Company, in transformers, switchboards, etc., is placed at about \$12,000, while the joint loss of the City and the Tramway Company will be about \$12,000. Loss fairly well covered by insurance.

Edmonton, Alta.—A permit has been issued to the Sisters of Charity, for the erection of a power house and laundry, to cost \$60,000, in connection with the General Hospital at this place.

Calgary, Alta.—P. A. O. Rodrigue, Calgary, has made application to the City Council for permission to construct a street railway system in Calgary, according to plans submitted. The matter will be taken up by a special committee of council.

Cardston, Alta.—A by-law will be submitted to the ratepayers of Cardston, Alta., to authorize the issue of \$20,000 in debentures for the extension of the local electric light and waterworks system.

Bridges, Wharves and Subways

Toronto, Ont.—On June 27th a by-law will be submitted to the ratepayers of Toronto, for the purpose of authorizing the expenditure of the sum of \$6,025,000, for the following works in the city of Toronto, viz.: Sewer, \$710,000; trunk sewer and filtration, \$5,200,000; Wilton avenue bridge, \$125,000.

Owen Sound, Ont.—The Board of Works, Owen Sound, has recommended that the City Engineer be instructed to prepare estimates and that by-laws be submitted to the ratepayers for the construction of a cement bridge at Union street.

Hamilton, Ont.—J. G. Sing, Government Engineer, has outlined to Mayor Stewart and others a scheme involving the expenditure of \$75,000 by Dominion Government, and \$25,000 by City of Hamilton, for improvement of the bay front. Plan provides for extension of therevet-

ment wall north of present city dock. This will necessitate a reinforced concrete pier, 30 ft. wide by 500 ft. long, faced with interlocking steel piles. The old wooden dock will be replaced with concrete wharf. The city will be asked to extend sewers through rectament wall, tear down frame buildings, and erect concrete building, at cost of \$25,000.

Peterborough, Ont.—The City Council of Peterborough, has decided to ask the Government for a grant to construct a new concrete wharf at this place.

Blyth, Ont.—The Morris Council propose to erect a new steel bridge over the river at island east of the town hall. County Engineer Patterson will be employed to prepare plans and specifications for the cement abutments, and also to inspect plans submitted for the steel superstructure.

Gorrie, Ont.—It is reported that a new steel bridge will be erected this coming summer at Gorrie. Further particulars may be obtained by addressing Town Clerk, Gorrie, Ont.

London, Ont.—At a special meeting of the Middlesex County Council, held recently, the Board of Directors recommended the acceptance of the following tenders for bridges: Lambeth Bridge, Westminster Township, Hamilton Bridge Works Company (steel), \$1,248; Chas. Ferguson (concrete), \$1,005; Second Street Bridge, Kamoka Road, Lobo Township, Petrolca Bridge Company (steel), \$1,060; Lev. Crouse (concrete), \$842; Bridge, concession 6, Lobo Township, Hamilton Bridge Company (steel), \$875; Lev. Crouse (concrete), \$639; Bridge, concession B, Ross Township, Hamilton Township, Hamilton Bridge Company (steel), \$373; Chas. Ferguson (concrete), \$725; Bridge, concession 5, over Aux Sauble, Bridgduph, Western Bridge & Equipment Company (steel), \$1,025; M. M. Hines (concrete), \$539; Bridge over Mud Creek, McGillivray Township, Samuel Pearson reinforced bridge, 33 ft. span, \$565; Bridge, concession 7, West Williams, Hamilton Bridge Company (steel) \$323; J. W. Harris (concrete), \$347. The committee also recommend that the tender of Hamilton Bridge Works Company, for steel superstructure for bridge over Mud Creek, concession 5, McGillivray Township, be referred to committee appointed in McGillivray Township to look after that county's needs.

London, Ont.—Preparations are being made in Brantford for the beginning of the construction of the Grand Valley Railway, on which it is expected work will be commenced shortly. The route has been confirmed as far as Woodstock. The city will insist on an overhead bridge across the London Hamilton Bridge tracks, in Westminster Township.

Chatham, Ont.—J. W. Dewhurst, of Woodstock, Ont., has been awarded the contract for the excavating and constructing of the C. W. & L. E. subway to be built under the Meligan Central tracks, near Charing Cross. Work will be commenced at once.

St. Thomas, Ont.—At a joint meeting of the City and Council Committees, the contract for the erection of a reinforced cement bridge to replace the Lynhurst wooden structure over Kettle Creek, was awarded to A. E. Ponsford, St. Thomas, at a contract price of \$9,529. The contractor will furnish all the material, with the exception of 29,000 lbs. of steel to be used for reinforcing, which will cost \$1,200.

St. Thomas, Ont.—The Public Improvements Committee, of the County Council have awarded the following contracts for bridges, viz: Appleton Bridge, J. Chivers, Belmont, at contract price of \$1,000; Orvill Bridge, G. A. Ponsford, St. Thomas, at contract price of \$3,710.

Almonte, Ont.—The Town Council of Almonte has been advised by the C. P. R. that the company will build a subway and granolithic walk in Almonte.

Sandwich, Ont.—The United States Steel Corporation will begin the construction of docks along the Canadian River front, below Sandwich, this coming summer, preparatory to erecting steel plants in connection with this industry.

Point Du Lac, Que.—The new light-house at Point du Lac has been carried away by melting ice. No. 3 pier has also been damaged.

Woodstock, N. B.—Power & Brewer, Woodstock, N. B., have been awarded the contract for the construction of a bridge for the C. P. R., at Upper Woodstock, where they will construct eight piers of cement and reinforced concrete; contract price, \$25,000.

Hampton, N. B.—R. Wetmore, Chief Engineer of Public Works, Ottawa, has

inspected the bridge over the Hammond River at Smithtown, and will recommend to his department that a new concrete pier be constructed to replace the trestles and bank foundations. This improvement will probably be followed by a new superstructure.

Moncton, N. B.—The Council of the Moncton Board of Trade will petition the Dominion Government to construct lighthouses along the Petitcodiac River. **St. John, N. B.**—The New Brunswick Telephone Company, at St. John, has been granted the right to lay conduits in Charlotte street, from corner of King to Duke street, and also in Princess street.

Winnipeg, Man.—The Board of Control has awarded to the Johann Company, of St. Louis, the contract for the second span of the power bridge across the Lee Channel, at contract price of \$2,700.

Victoria, B. C.—The Chief Commissioner of Lands and Works for the Province of British Columbia, will make application to the Governor General for approval of plans for a bridge to be erected by the Government of British Columbia, over Canoe Pass, Fraser river. B. C. Plans are on file with Minister of Public Works, and the Minister of Marine and Fisheries, Ottawa, and a duplicate thereof has been deposited in the office of the Registrar of Deeds, New Westminster. B. C. F. C. Gamble, Public Works Engineer, Victoria, B. C., can be addressed.

New Westminster, B. C.—Application has been made to the Governor-in-Council for approval of plans of a bridge to be constructed by the Victoria Terminal Railway and Ferry Company, over the Serpentine River on the line of said company's railway, between Blaine and Oliver's, in the Province of British Columbia. Plans and description of site are deposited with the Minister of Public Works, and in Land Registry office, New Westminster, B. C.

New Westminster, B. C.—Application has been made to the Governor in Council for approval of plans of a bridge to be constructed by the Victoria Terminal Railway and Ferry Company over the Nicomiot River, on the line of the said company's railway, between Blaine and Oliver's, in the Province of British Columbia. Plans and description of site on file with the Minister of Public Works, and in Land Registry office, New Westminster, B. C.

Vancouver, B. C.—Plans for the erection of a scenic bridge across the First Narrows, have been presented to the Board of Park Commissioners, Vancouver. The Burrard Bridge Company is making the application. The structural feature of the bridge is to be a tower 225 ft. in height, and 10 ft. in diameter at its base, on the north side of the Narrows, to be connected by cable with a smaller tower on Prospect Point, a distance of 1,280 ft. A passenger elevator will be installed in the tower.

New Westminster, B. C.—Mr. Henry, of New Westminster, announces that he has assurances from the Ottawa Government that between one and two million dollars will be expended this year in New Westminster harbor improvements. The Fraser river is to be deepened and a jetty, three miles long, to be erected at the mouth of the river.

New Westminster, B. C.—Managing Director Butzen, of the British Columbia Electric Railway, held a conference with the City Council, New Westminster, recently, regarding the erection of a new dam at Lake Quatnam.

Vancouver, B. C.—The City Finance Committee has decided to appropriate \$50,000, of which \$25,000 will be used for the Granville street bridge, and \$25,000 for the Westminster avenue bridge.

Calgary, Alta.—The C. P. R. has awarded to Carret, Hall, Aldinger Co., Winnipeg, Man., the contract for the two subways to be constructed at Calgary, at contract price of \$25,000. Work will be commenced immediately.

Red Deer, Alta.—A new steel bridge will be built over the river at Red Deer, Alta., which has been made a new divisional point of the C. P. R.

Saskatoon, Sask.—The citizens of Saskatoon have voted the sum of \$20,000 for a traffic section to the new C. P. R. bridge.

Waterworks, Sewers and Canals

Trenton, Ont.—Robert, Weddell, of Trenton, Ont., has been awarded the contract for the work to be done in connection with the new western channel. The new channel will be 400 ft. in width between the piers, and 13 ft. in depth. The south pier will be 2,500 ft. in length and the north pier 2,200 ft. The superstructures of the piers will be of con-

crete. The Dominion Government has appropriated \$175,000 for this improvement.

Preston, Ont.—Engineer Davis has prepared plans for a new sewer system to be constructed in Preston, Ont. A filtering system will be installed. Tenders will be called for in the near future.

Brantford, Ont.—At a meeting of the Water Commissioners, Brantford, the contract for the extension of the waterworks plant at Brantford was awarded to H. F. Moore, of Kingston, at contract price of \$15,000. A new gallery will be built and other improvements made.

Guelph, Ont.—Engineer Davis has been asked to submit plans for both a steel and cement stand pipe to be erected on top of Day's mill, in connection with the pure water scheme. The cement stand pipe would be reinforced by steel.

Ottawa, Ont.—The following contracts have been awarded for construction of different sections of the Trent Canal: Section No. 2, Holland River division of the Trent Canal, Jno. Riley, of St. Catharines; Rosedale section of Trent, R. Macdonald Company, of Toronto; Section No. 1 of the Ontario-Rice Lake division, Larkin & Sangster, of St. Catharines.

Victoria Harbor, Ont.—The Department of Public Works, Ottawa, has under consideration extensive improvements to Victoria Harbor, Ont. It is understood that the Government will dredge the channel, and build a wharf capable of accommodating large steamers.

London, Ont.—The Water Commissioners will submit to the City Council, London, to be embodied in a by-law, a plan of extension which will take in the Kilworth, White and Cronyn Springs, and locate a high pressure plant and a filtration plant where needed. It is estimated that the cost of the work contemplated will be about \$60,000.

Waterloo, Ont.—A by-law will be submitted to the ratepayers of Waterloo, for authorizing the expenditure of \$5,000 for waterworks extensions and improvements at Waterloo, Ont.

Gananoque, Ont.—The contract for waterworks and sewer connections at this place has been awarded to Richard Wilson, Brock street, Gananoque.

Kingston, Ont.—Contracts have been awarded for the laying of a four-inch cast iron water main and a nine-inch sewer, on St. Mary's-on-the-Lake property, King street west, to Simmons Bros., and Elliott Bros., respectively, both firms of Kingston.

Owen Sound, Ont.—The Board of Health, Owen Sound, will recommend to the City Council, the construction of a sewer on Poulett street, from Union to Division street.

Montreal, Que.—At a meeting of the Council of Notre-Dame de Grace, a contract for two sections of the new sewerage system was awarded to Messrs. Henuault & Hefferman, Montreal, Que., at a contract price of \$70,000.

Montreal, Que.—The West Ward has sent in a petition for the installation of high-pressure water supply system and it is expected that a plant will be established in the near future.

Montreal, Que.—The Water Committee have decided to purchase from the John McDougall Caledonian Iron Works Company, Ltd., of Ville Marie, Que., a million gallon Worthington pump, at cost of \$29,365.

Montreal, Que.—The Waterworks Commission has asked for, approximately, \$500,000, to be expended in waterworks improvements: \$90,000 for laying of new water mains in the annexed part of Rosemont; \$180,000 is required to construct a 30 inch water main from Atwater avenue to Delormier ave. of which \$50,000 has already been granted by the City to purchase a iron piping. The balance of the amount is to be used for extensions, etc., on various streets. Further information can be obtained from Superintendent Janin, Montreal, Que.

Montreal, Que.—The Waterworks Commission has asked for \$30,000 for cementing the eastern bottom of the McTavish street reservoir.

Ville Marie, Que.—Tenders will be received by the undersigned up to May 20th, for waterworks and sewers at the village of Ville Marie, Que. J. Millard, Secretary-treasurer, Ville Marie, Que.

Victoria, B. C.—The City of Victoria has authorized the Water Commissioner to start the construction of a \$100,000 reservoir at Smith's Hill. Steel piping and a new centrifugal cross compound pumping engine, with capacity of 1,400,000 gal. per day will be installed at the North Dairy Farm pumping station.

Victoria, B. C.—Tenders will be received by the undersigned up to 4 p.m. May 26 for the supplying of certain gate valves for the Victoria Waterworks

Works. Plans and specifications may be obtained at office of the undersigned, W. W. Northcott, purchasing agent, Victoria, B. C.

Victoria, B. C.—Tenders will be received by the undersigned up to 4 p.m., May 18th, for supplying the City of Victoria with 70 tons of pig lead for waterworks system. Plans and specifications may be had at office of undersigned, W. W. Northcott, purchasing agent, Victoria, B. C.

Vancouver, B. C.—City Engineer Clement, Vancouver, has prepared plans for the construction of a sewerage system for Kitsilano, at cost of \$300,000. Plans call for a trunk sewer emptying into the bay at the foot of Maple street.

Vancouver, B. C.—The Board of Works, Vancouver, has recommended the following sewer extensions in this city, viz.: Vernon Drive, from Barnard street to Harrison street, \$350; Westminster road from George street to Victoria street, to Westminster street and Twelfth avenue, \$1,240; in lane between Howe street and Horwood street, from Pacific to Beach, \$1,040; on Quebec street from Sixteenth avenue to line and extending east along the avenue, \$975; Tenth avenue from Heather street to Ash street, \$1,100; Eleventh avenue from Heather street to Ash street, \$1,100.

Portage la Prairie, Man.—At a meeting of the citizens of Portage la Prairie, it was decided to expend the sum of \$50,000 on an auxiliary waterworks system.

Saskatoon, Sask.—A by-law has been passed authorizing the expenditure of \$130,000 for an extension to the waterworks and sewerage systems, in Saskatoon.

Edmonton, Alta.—The following contracts have been awarded for sewer pipe, etc., for the City of Edmonton, viz.: Edmonton Concrete Company, sewer pipe, \$7,075; Gorman Clancey & Crindley, galvanized iron pipe, \$1,232; J. Robertson & Co., lead pipe, \$5.00 per hundred lbs.; Northern Supply Co., brass goods, \$1,539.

Railway Construction

Toronto, Ont.—The Grand Trunk Railway Passenger Department has awarded the contract for enlarging its up-town ticket office, King and Yonge streets, to the Toronto, Waterloo Company. About \$15,000 will be spent in re-fitting and improving the place.

Port Arthur, Ont.—W. C. Chambers and W. A. McCaffrey, of Kenora, have been awarded the contract for the first seven and one-half miles of the Transcontinental railway.

Guelph, Ont.—The C. P. R. will erect a new passenger station in Guelph this coming summer. The building will be located at the upper end of the Main street.

Ottawa, Ont.—At a meeting of the Railway Committee, Ottawa, it was ordered that the Manitoulin and North Shore Railway Company spend \$25,000 on the Manitoulin section before July 15th, at which date it must satisfy the Board of Railway Commissioners of its financial ability to complete the work within two years.

Ottawa, Ont.—Two contracts for the supply of concrete for the I. C. Railway have been awarded to the Dominion Concrete Company, of Kemptville, Ont.

Hespeler, Ont.—The Galt, Preston and Hespeler Electric Railway is contemplating the erection of a new station building and freight shed at Hespeler, Ont.

Kingston, Ont.—Chas. M. Hays, Second Vice-President and Manager of the Grand Trunk Railway, has notified the Kingston Board of Trade that extensive improvements will be made to the railway system at Kingston. Mr. Hays also states that the Kingston, Smith's Falls and Ottawa Railway will be pushed through just as soon as funds permit.

Montreal, Que.—The contract for pile driving, excavation and concrete work of the bridges to be erected this season on Lake Superior division of the Canadian Pacific Railway, has been awarded to Frank Brunet, Montreal, Que.

Quebec, Que.—Extensive alterations will be made to the interior of the Quebec & Lake St. John Railway Offices, at this place.

Woodstock, N. B.—Power & Brewer, N. B., have been awarded the sub-contracts for the concrete work on the Kitchen Company's section of the G. T. P. between Grand Falls and Tobique River, at contract price of \$350,000.

Fredericton, N. B.—Mayor Chesnut, Alderman W. E. Farrell and Mr. Crockett, M. P., Fredericton, have made application to the Minister of Railways for

the erection of a new station building at Fredericton, N. B. It is estimated that the building will cost \$60,000.

Cardston, Alta.—E. Hoffman, of New York City, is at the head of a Canadian syndicate which proposes building a railway from the American boundary to the southeast of the town to Dawson City. The company, which will be known as the Northern Empire Railway Company, is seeking permission to bond the railway to the extent of \$30,000 per mile. Associated with Mr. Hoffman are H. Roy and E. Balfour, Ottawa; D. C. J. B. Gusseluhn, Notre Dame de Stanbridge, Que.; J. J. Plutot, Frank, Alta. It is expected that preliminary surveys will be started at once.

Edmonton, Alta.—The C. P. R. will this summer expend the sum of \$50,000 in improvements to the roadbed on the C. and E. between Strathcona and Calgary.

Red Deer, Alta.—The C. P. R. will erect a round house at Red Deer, which will be made a divisional point on the C. and E.

Public Buildings

Toronto, Ont.—The Board of Works has advised the Council to accept the following tenders for the public bath house and comfort station, viz.: Plumbing, K. J. Wilson, \$3,900; heating, Geo. Snye, \$4,150; wiring, W. J. McGuire, \$500; laundry machinery, Toronto Laundry Machinery, \$1,650.

West Toronto, Ont.—Andrew Carnegie has agreed to donate \$20,000 for the erection of a Carnegie Library at this place, on provision being made for a suitable site, and \$2,000 a year for its maintenance. A. B. Rice, Chairman of the Public Library Board, West Toronto, may be addressed.

Mitchell, Ont.—The town of Mitchell will erect a \$1,000 Carnegie Library as soon as a suitable site is selected.

Milton, Ont.—The Town Council, Milton, has decided to accept Andrew Carnegie's offer of \$5,000 for the erection of a library building. A committee has been appointed to select a site, and it is expected that the building will be completed this summer.

Beaverton, Ont.—A by-law will be submitted to the ratepayers of Beaverton for the purpose of authorizing the expenditure of \$12,000 for the erection of a new town hall at this place.

Mitchell, Ont.—A site on St. Andrew's street has been purchased for the erection of the new \$1,000 Carnegie Library building, at Mitchell, Ont.

Burlington, Ont.—William Kerns, of Burlington, will erect a new brick post office building, 20 by 26 ft., on the site of the present post office building.

Owen Sound, Ont.—A new three-storey post office building will be erected by the Government at Owen Sound in the near future.

Dundalk, Ont.—The contracts for the erection of the structure to be had were awarded as follows: F. V. Bellamy, Dundalk, foundation and drainage work; Henderson & McAuley, Dundalk, joiner and carpenter work.

Glencoe, Ont.—Plans and specifications have been prepared at the Department of Public Works, Ottawa, for a new post office and customs office to be erected at Glencoe, Ont.

Guelp, Ont.—Nagle & Mills, of Ingersoll, have been awarded the contract, by the Dominion Government, for the erection of an addition to the Guelp Armory, at a contract price of \$14,000.

Renfrew, Ont.—The contract for the new post office, Renfrew, has been awarded to Joseph Battique, who can be addressed at this place. It is expected that work will be started immediately.

Chatham, Ont.—Moore & Stephens, of Chatham, have been awarded the contract for the erection of the Raleigh Township Hall, at Chatham, Ont. Contract price, \$3,000.

Montreal, Que.—The sum of \$20,000 has been appropriated by the Dominion Government for a postal station B. on St. Catherine street. The re-vote of \$20,000 for the new postal station at Point St. Charles was also passed, a site for which will be purchased shortly.

Montreal, Que.—The Department of Public Works, Ottawa, has passed the \$20,000 re-vote for the new military stores building, to be erected in Montreal.

Quebec, Que.—Plans are being prepared for the erection of a grand stand, with seating capacity of between 15,000 and 20,000, on the Plains of Abraham, Que.

Verdun, Que.—The plans prepared by Ross & McFarlane, Architects, 51 Bank of Ottawa Building, Montreal, for the new municipal buildings to be erected at Verdun, Que., have been accepted. Plans

call for town hall, with seating capacity of 600, police and fire departments, and municipal offices.

Moncton, N. B.—The Moncton Board of Trade will petition the Dominion Government for an armory to be erected in Moncton.

St. John, N. B.—The Dominion Government has decided to make the following improvements to the buildings at St. John, viz.: St. John Dominion building, improvements, repairs, etc., \$4,000; St. John military buildings, addition to stores building and wagon and gunshed, \$6,000; St. John quarantine station, Partridge Island, to install complete water service, etc., \$2,500; site of former quays of the building, Partridge Island, site for steam sterilizer, dwelling for boatmen, improvements and repairs, etc., \$5,000.

Halifax, N. S.—At a meeting of the City Council, Halifax, it was decided to purchase the fuel yard at this place, as a site on which to erect a new market building at a cost of \$12,000.

Winnipeg, Man.—The James McDiarmid Company, of Winnipeg, who have the general contract for the new examining warehouse to be erected in this city, have sublet to the Manitoba Iron Works, Ltd., the contract for the structural iron and steel, at contract price of about \$100,000.

Winnipeg, Man.—A. E. Ormsby, Limited, Winnipeg, has been awarded the following contracts, viz.: Sheet metal and roofing work on new post office at Selkirk, Man., and new post office at Neufville, Man.; buy of windows and doors for the new Calgary Land Titles building; fireproof windows and doors for the Syndicate Block, Brandon, Man.; fireproof windows for the J. Y. Griffin building, Winnipeg, Man.

Winnipeg, Man.—Clyde Bros., Winnipeg, have been awarded the contract for the construction of the Assiniboine Park pavilion, at contract price of \$17,360.

Vancouver, B. C.—Gillespie & Binnie, Vancouver, have been awarded the general contract with the exception of the plumbing, for the erection of a new bathing pavilion at Kitsilano, at contract price of \$3,575. The contract for the plumbing has been let to Chas. Morgan, Vancouver, at contract price of \$650.

Victoria, B. C.—Plans prepared by D. Frame, have been accepted for a new agricultural hall to be erected at the exhibition grounds. The building will be one storey in height, with floor space of about 20,000 square feet. Work will be commenced at once.

Calgary, Alta.—Alderman Munarey, Calgary, has prepared plans for the proposed new crematorium to be built in the west end of the city. A by-law, authorizing the raising of sufficient funds for this project, will be submitted to the ratepayers in the near future. It is estimated that the crematory will cost \$11,000.

Saskatoon, Sask.—The contract for the electric wiring and fixtures for the new post office, now in the course of construction at this place, has been awarded to Saskatoon Electric Supply Co.

Business Buildings

Toronto, Ont.—Architects Simpson & Young, 17 Toronto street, have awarded the contract for alterations to the Jamieson store building, Yonge and Queen streets, to Messrs. Curry & Ross, Toronto. The improvement provides for a new doorway and the following materials have been specified: Tile work, mosaic work, leaded glass, plate glass, luxury prisms and galvanized iron work.

Kingston, Ont.—J. W. Richardson, Kingston, is contemplating the erection of a five or six storey building on the corner of Brock and Wellington streets, to be used for stores, offices and lodge rooms.

Ottawa, Ont.—Architect A. Tracy, 337 Gladstone avenue, Ottawa, has prepared plans for a two storey building to be erected on Lisgar street for Mr. Harris, undertaker, Wellington street. The building will be of brick construction, concrete foundation, pitch and gravel roof, wood interior finish, hot water heating, electric lighting and enamel plumbing, sidewalk lift, sheet metal work, metal ceiling, plate glass.

Ottawa, Ont.—Architect W. E. Noffre, Central Chambers, Ottawa, has prepared plans for an office building to be erected on Sparks street, Ottawa, for Bluchstein Bros. The proposed building will cost \$125,000.

Hamilton, Ont.—A. V. Beene, Hamilton, has been granted a permit for the on King street, near Wentworth street,

erection of two stores and apartments at a cost of \$10,000.

Hamilton, Ont.—A new three storey building, 60 ft. deep, will be erected by Thos. Crooks, at the corner of King and MacNab streets. The first storey of the building will be of stone, and the upper storeys brick and stone.

Port Stanley, Ont.—Architect Wm. G. Murray, London, has received tenders for a \$30,000 factory building to be erected in Port Stanley, for the Standard Implement Co., Limited. The building will be of brick construction, with concrete foundation, patent roof; dimensions 100 by 50 feet.

Port Stanley, Ont.—The following contracts for the erection of a two storey business block for Matt Loney at Port Stanley, have been awarded by Architect N. K. Darrach, St. Thomas. Masonry, Albert E. Tomford; carpentry, Green & Sons, both of St. Thomas.

St. Thomas, Ont.—The Brotherhood of Locomotive Engineers, have formed a joint stock company, with capital of \$40,000, for the purpose of erecting a brick block in St. Thomas, the upper rooms of the building to be used as lodge rooms.

St. Thomas, Ont.—Architect H. R. Darrach, St. Thomas, has prepared plans for a new block to be erected by Ingram & Davey, at the corner of Talbot and Southwick streets. Specifications call for a building 40x115 ft., three storeys high, with a warehouse at the rear 40x55 ft., two storeys high. The structure will be of pressed brick.

Stevensville, Ont.—Samuel House, contractor, Stevensville, will erect a business block on the corner opposite the Hutchinson hotel. The structure will be two storeys and basement in height, of brick masonry construction, and will cost \$5,000.

Peterboro, Ont.—Patrick Hogan, Peterboro, will erect two store buildings on the lot on Hunter street, formerly occupied by John Craig's blacksmith shop.

Owen Sound, Ont.—Oswald Hinds, of Mantowaning, will erect a two storey brick block in Owen Sound at the corner of Baker and Scope streets. The new building will be commenced as soon as the ground can be cleared.

Chatham, Ont.—Architects J. L. Wilson, Son & Arnold, Chatham, have prepared plans for extensive improvements to be made to the R. O. Miller Block, Chatham.

Montreal, Que.—The Beyer Estate, Montreal, will alter their present premises into a store, and put in new stone front at a cost of \$12,000. The architects are Ross & McFarlane, The Laurier Construction Co., Montreal, has the general contract.

Montreal, Que.—J. B. Dupro, 321 Chamboard street, Montreal, will erect four buildings, of one dwelling and two stores each, at a cost of \$2,000.

Winnipeg, Man.—Plans and specifications have been prepared for a three storey block to be erected on Portage avenue, adjoining the Steele block, for Mr. Farmer, of Hamilton, Ont. Plans call for five stores on the ground floor, and two upper storeys to be used for apartments. Foundations will be constructed to carry a five storey building.

Winnipeg, Man.—Permit has been issued to the Ontario, Manitoba & Western Land Company, for the erection of a store and apartment block on northeast corner of Portage avenue and Carlton street. The building will be three storeys in height and will cost \$25,500.

Dauphin, Man.—Thos. Malcolm, Dauphin, has awarded the contract for the erection of a solid two storey brick block to J. Haferbrock, of this place.

Minitonas, Man.—J. H. Cannon, Minitonas, whose business building was destroyed by fire, is having a site excavated and will erect a new structure shortly.

Vancouver, B. C.—The Imperial Trust Co., Vancouver, will erect a thirteen storey office building to cost \$600,000, at corner of Cambie and Hastings streets, Vancouver. The exterior of building will be of brick and terra cotta. The entire steel frame will be encased with concrete, and will be fireproof throughout. Marble will be used for entrance halls, corridor, wainscoting and floor borders and also for the lavatories throughout. Termzo will be used for the ground floor interior walls and ceilings throughout will be of expanded metal on channel frames, plastered solid. Four elevators will be installed. A permit for the structure has been issued.

Vancouver, B. C.—W. W. Haywood, Vancouver, B. C., has been granted a permit for the erection of a brick block on Hastings street, between Westminster

ster and Gore avenues, at a cost of \$20,000.

Victoria, B. C.—Dinsdale & Malcolm, Victoria, B. C., have been awarded the contract for rebuilding the Mahon block, Victoria, which was recently destroyed by fire, entailing a loss of \$10,000.

Victoria, B. C.—H. K. Knott, Victoria, has been awarded the contract for the erection of a one storey garage at the corner of Broughton and Wharf streets. The building will be of brick construction, with cement floors, and galvanized iron roof. Architects Hooper & Watkins, Victoria, B. C.

New Westminster, B. C.—J. Jones, New Westminster, has purchased a site on Twelfth street, on which he will erect a row of store buildings.

Kamsack, Sask.—Mr. S. Johnson, Kamsack, Sask., will erect a new frame store building at this place, this coming summer.

High River, Alta.—The store building of Behl & Jacobs, High River, Alta., has been totally destroyed by fire, entailing a loss of \$15,000, covered by insurance. It will probably be rebuilt.

Banks

Hamilton, Ont.—Architect Chas. Mills, Hamilton, has prepared plans for a stone and pressed brick building to be erected for the Dominion Bank. Owner Thos. Crooks, of Hamilton. It will be three storeys in height, 50x60 ft., and will have flat gravel roof, oak interior finish, hot water heating, electric lighting, plumbing, marble, terra cotta, tile, ornamental iron, vaults, plaster relief work, and plate glass. The Dominion Bank will occupy the entire ground floor.

Welland, Ont.—The Imperial Bank will erect a new bank building on the lot next to the post office at Welland, Ont. It is expected that the work will commence in the near future.

Stevensville, Ont.—Samuel House, Stevensville, has purchased the corner lot opposite the hotel, on which he will erect a building to be occupied by the Sterling Bank.

Moncton, N. B.—Jas. Reid, Moncton, has been awarded the contract for the new Bank of Montreal building, to be located on corner of Main and Botsford streets. The building will be of stone construction.

Winnipeg, Man.—Work will be commenced at once on the new Bank of Nova Scotia building, to be located on the southwest corner of Portage avenue and Garry street, Winnipeg. The structure will be absolutely fireproof, with outside of granite. It will be four storeys, the two lower floors to be used for bank purposes and upper two as general offices. All the floors will be of reinforced concrete, with marble mosaic in the rotunda and banking rooms, and upper floors of marble tile. All partitions will be of tile. The structure will cost \$250,000.

Cranbrook, B. C.—Tenders will be received by the undersigned up to noon, May 23, for the following work in connection with a bank building to be erected at Cranbrook, for the Imperial Bank of Canada, viz.: 1. Excavating, concrete, brick work, marble work, carpenter and joiner's work, roofing, plastering and painting. 2. Electric lighting. 3. Plumbing, heating and sheet metal work. R. Percy Barnes, architect, 141 Jasper ave., Edmonton, Alta.

Clubs and Societies

Toronto, Ont.—Architects Stroud & Saunders are preparing plans for a three storey and basement, 50x132 ft., lodge building, to be erected at corner of College street and Euclid avenue, for the Western District, Y. O. T. The building will be of brick and stone construction, with steel beams and gusses, steam heating, combination lighting, open plumbing, and will cost about \$40,000. It will contain a large auditorium, various lodge rooms and caretaker's apartments.

Toronto, Ont.—The Young Women's Christian Guild, Toronto, have purchased a lot, 52x45 ft., to the rear of their hall on Elm street, on which they propose to erect a \$15,000 gymnasium building.

Toronto, Ont.—Architects Ellis & Conery, Manning Chambers, Toronto, have prepared plans for a two storey 16x55 ft. club building, to be erected for the Parkdale Lawn Bowling Club. The building will be of brick construction with marble roof, plumbing, and hot air heating. Cost \$3,000.

Walkerville, Ont.—The Tecumseh Boat Club, Walkerville, will erect a new club house at a cost of \$15,000, to replace the structure recently destroyed by fire.

Quebec, Q.—The Woman's Christian Association has purchased the property

at the corner of St. Ann and St. Ursule streets, on which they will erect a new building.

Glace Bay, N. S.—The contract for repairing and renovating the Oddfellows Hall building, which has been partially destroyed by fire, has been awarded to Marshall Tolme, Glace Bay, N. S. Work will be commenced at once.

Winnipeg, Man.—The Young Women's Christian Association is contemplating the erection of a \$75,000 building in Winnipeg.

Fernie, B. C.—The plans of Campbell & McLaren, Vancouver, have been accepted for the proposed building to be erected at Fernie for the Miners' Union. The building will be of brick construction, four storeys in height, and will contain stores, a large auditorium and various halls. It will cost approximately \$25,000.

Victoria, B. C.—The Union Club, Victoria, is contemplating the expenditure of \$40,000 for improvements to its building. The work will include the erection of an addition and extensive alterations.

Opera Houses and Rinks

Ottawa, Ont.—The Rideau Curling Club have decided to erect a new \$20,000 rink on the site of the present structure. The building will be two and a half storeys in height, and of brick construction.

Brantford, Ont.—Frank C. Johnson, 160 Darling street, Brantford, will erect a new theatre building on the skating rink property at the place.

Peterboro, Ont.—The contract for the erection of the new curling rink on Charlotte street, has been awarded to James Montgomery, Peterboro.

Montreal, Que.—The Royal Curling Club, Montreal, has secured a site east of the river at the corner of St. Charles street, on which it will erect their new curling rink.

Winnipeg, Man.—Permit has been issued for the rebuilding of the Winnipeg theatre, at cost of \$40,000. Jas. McDiarmid Company, Winnipeg, has the contract for the work.

Shoal Lake, Man.—Architect A. F. Nesbitt, of Hamiota, Man., has been commissioned to prepare plans for an opera house to be erected at Shoal Lake, Man.

Strathclair, Man.—The Agricultural Society, Strathclair, has decided to erect a large combined agricultural hall and skating rink, on the agricultural grounds.

Coleman, Alta.—The contract for the Coleman Miners' Hall and Opera House, Coleman, Alta., has been awarded to Edmond Disney, of this place. The contract for heating system has been awarded to J. Hill, Coleman.

Asylums and Hospitals

London, Ont.—The revised plans made by Architect Nutter, London, for the new Isolation Hospital, have been approved by the members of the special hospital committee. The plans provide for a building to cost \$70,000.

Fort William, Ont.—It is proposed to erect a \$75,000 addition to the hospital building at Fort William.

Welland, Ont.—Marcus Vanderburgh, Welland, has been awarded the contract for the masonry work on hospital to be erected at this place.

Brantford, Ont.—Plans have been prepared for the erection of a \$10,000 nurses' home, in connection with the local hospital at Brantford.

Souris, Man.—At a special meeting of the Hospital Board, a committee was appointed to wait on the town and rural councils, regarding issuing of debentures for the erection of a new hospital building at Souris, Man.

Victoria, B. C.—Architect W. T. Dalton, of Dalton & Evelyn, Vancouver, has submitted plans for the proposed sanatorium to be erected at Tranquille, at an estimated cost of \$75,000. Building will be commenced as soon as funds permit. Funds on hand approximately \$22,000.

Victoria, B. C.—Architects Hooper & Watkins, Victoria, have prepared plans for a new building to be erected for the Chinese Girls' Rescue Home, on the property immediately adjoining the present structure on Commercial street. It will be two storeys high, of brick construction, stone foundation, and slate roof, and will cost about \$12,000 and \$13,000. The Pacific Building and Contracting Company have been awarded the general contract.

Victoria, B. C.—The Board of Directors of the Jubilee Hospital, Victoria, have instructed Architect Keith, Victoria, to prepare plans for the erection of a nurses' home on the hospital grounds.

Lillooet, B. C.—On application of Mark Bagelson, M.P.P., Lillooet, B. C., the Provincial Government has agreed to grant sufficient land from the government reserve on which to erect a provincial hospital building at this place. It is expected that the structure will be erected in the near future.

Vernon, B. C.—The directors of the Vernon Jubilee Hospital have awarded the contract for the construction of the new building to T. E. Crowell, Vernon, B. C., at contract price of \$43,443. The contract for heating and plumbing has been awarded to the Vernon Hardware Company, at a contract price of \$14,202.

Saskatoon, Sask.—A by-law has been carried providing for the erection of a \$55,000 municipal hospital at Saskatoon, Sask.

Ponoka, Alta.—The Seventh Day Adventists propose erecting a \$25,000 sanitarium at Ponoka this coming summer.

Edmonton, Alta.—A permit has been issued to the Sisters of Charity, for a \$40,000 addition to be erected to the general hospital, on Victoria avenue.

Schools and Colleges

Toronto, Ont.—Contracts for the erection of the addition to St. Francis' school, have been awarded as follows: Mason and brick work, John McGlue, \$5,037; carpentry work, Madden Bros., \$2,733; plastering, H. J. Madden, \$457; plumbing, Toronto Furnace Co., \$919; painting, M. J. Phelan, \$385; heating, J. E. Gray, \$940.

Toronto, Ont.—The Hiscott Dermatological Institute, College street, Toronto, has purchased a site, 45x100 ft. on the south side of College street, just east of Elizabeth street, on which they will erect a new building.

Hamilton, Ont.—The Technical Education Committee, Hamilton, have recommended that a school building be erected on the College Institute grounds, at cost of \$40,000.

Hamilton, Ont.—The Board of Education has approved of the scheme proposed by the Internal Management Committee, to expend \$250,000 on building new schools, and extending present school system. The schools to be enlarged include: Picton street school, eight rooms, to cost \$35,000; rebuilding Victoria street school, at cost of \$75,000; Canon street school, to be enlarged to a four room school, at cost of \$62,000; Murray street school to be rebuilt at a cost of \$40,000, into a ten room building.

Hamilton, Ont.—The following contracts have been awarded for work on South street school extension: Masonry and brickwork, Hancock Bros., \$12,357; carpentry work, W. J. Reid, \$6,730; painting, Wm. Barrett, \$1,175; plumbing, Adam Clark, \$4,200; roofing, Thos. Irwin & Son, \$1,833.

Orillville, Ont.—Tenders were recently received for the erection of a high school building at Orillville, Ont. Plans and specifications were prepared by Chapman & McGiffin, architects, 59 Yonge street, Toronto.

Paris, Ont.—Architects Simpson & Young, 17 Toronto street, have awarded the general contract for the erection of a two storey and basement, four room school building, to be erected in Paris, Ont., to Tindall & Co., Woodstock, Ont. The building will be of brick and stone construction, concrete foundation, structural steel columns and girders, felt and gravel roof, open plumbing, steam heating, ventilating system. Cost \$55,000.

Ottawa, Ont.—Alex. Garveck, Ottawa, has been awarded the contract for the brick and stone work on the addition to Cambridge street school, Ottawa, at contract price of \$12,450. The steel work was let to the Canadian Agency & Sundry Co., Ottawa, at \$1,570.92.

Ottawa, Ont.—The Public School Board, Ottawa, has awarded the following contracts for addition to Elm street school: Brick, stone and excavating work, A. Garveck, \$12,250; carpenter work, Christie & McCreadie, \$11,769; plastering, A. Bowman & Son, \$533; painting and glazing, W. J. Carson, \$1,332; roofing, J. C. Adams, \$220; plumbing, J. R. McLennan, \$4,355; galvanized iron work, McFarlane & Douglas, \$1,947; electric wiring, telephones, fire alarms and gongs, C. A. L. Eilaent, \$515.76; steel beams, columns, etc., Canadian Agency & Supply, \$1,914.06. All the above firms are of Ottawa.

Ingersoll, Ont.—The property committee of the Board of Education, Ingersoll, has been authorized to procure plans for the proposed four room school building to be erected in Ward One.

Owen Sound, Ont.—Plans made by Architects Forster & Clarke, Owen Sound, have been accepted for the erection of the proposed addition to the Boyd street

school, Owen Sound. The improvement will cost \$10,000, including steam heating.

Niagara Falls, Ont.—Chairman Wood, of the School Board, Niagara Falls, reports the purchase of a site on which a two room school building will be erected.

London, Ont.—Architect Wm. G. Murray, London, received tenders up to May 11th for a \$20,000 school building to be erected on Lorne avenue. The building will be partly in roof, two storeys, in height, slate foundation, slate roof.

Fort William, Ont.—The Board of Education, Fort William, has awarded the following contracts for the new school building to be erected at this place: Brick and stone work, Street Bros.; carpenter work, Russell Bros.; plastering, J. H. Perry; heating and plumbing, Superior Heating Co.; iron work, J. & T. M. Piper; painting, Robertson & Cartwell; electric wiring, Hinners & Jones.

Sparta, Ont.—A by-law has been passed providing for the issue of debentures to the extent of \$5,000, for the erection of a new school building in school section No. 7, Sparta.

Dundas, Ont.—A by-law providing for the borrowing of \$16,000 by debentures for the erection of a new high school building at Dundas, has had its second reading.

Newmarket, Ont.—Plans have been prepared for the new Friends' College building, which will be located on the farm of George Williams, Newmarket. Mr. Cody, Newmarket, can be addressed.

Swansea, Ont.—At a representative meeting of the ratepayers of Swansea, it was decided to proceed at once with the erection of an addition to the school building, Swansea. The addition will cost between \$30 and \$7,000.

Kingston, Ont.—The Royal Military College, Kingston, proposes to erect a new \$80,000 building to be used as servant's quarters. Lieut.-Col. Biggar, of Ottawa, and Chief Engineer Fuller, Department of Public Works, Ottawa, have been in Kingston in connection with this enterprise.

St. Catharines, Ont.—The St. Catharines Public School Board will receive up to May 20th, competitive plans, specifications and guaranteed estimates for the erection of a six room public school building at this place. The proposed building is to be plain; ventilation, light and sanitation to be given prominence. Jas. B. Macdonald, secretary, St. Catharines.

Montreal, Que.—A site comprising 170,000 sq. ft., located on West Sherbrooke street, has been purchased for the purpose of erecting a \$550,000 technical school. The purchasing committee composed of the following: G. DeSerres, J. J. Fortin, J. A. Gaudet, J. A. McQuinn, representing the Quebec government; W. J. White and Ald. Dagenais representing Montreal; Peter Lyall, representing the Board of Trade, and A. V. Roy, the Chambre de Commerce.

Montreal, Que.—The Catholic School Board has awarded the contract for electric fixtures for the de Salaberry school, to the Standard Construction Company, at contract price of \$1,683.

Quebec, Que.—At a meeting of the Roman Catholic School Commissioners, Quebec, it was reported that the Legislature had adopted the bill authorizing the issuing of debentures to the extent of \$250,000 to be utilized in building new schools in St. Jean Baptiste suburbs. Cap Blanc, St. Roch and Jacques Cartier, are to repair to the present school buildings.

Yarmouth, N. S.—The trustees of school section No. 18, Yarmouth, have decided to rebuild the Paddon's school on Yarmouth Heights at a cost of \$5,000.

Wolfville, N. S.—The Astronomical Observatory of Acadia University, at Wolfville, N. S., has been destroyed by fire.

Wolfville, N. S.—At a meeting of the Board of Governors of Acadia College, plans prepared by Architect C. H. DeChure, of Cambridge, Mass., who is at present in Wolfville, were accepted for the erection of the new Science building.

St. John, N. B.—The School Trustees, St. John, have secured the lease of a lot in Spring street, on which it is proposed to erect a two storey brick school building, containing four or six rooms.

Winnipeg, Man.—The Winnipeg School Board has purchased a site, 450x250 ft., between McIntosh and Poplar avenues, on which it will erect a \$75,000 school building.

Winnipeg, Man.—Tenders were received at the office of the Winnipeg Public School Board up to May 9th, for the erection of a nine room addition to the Mulvey school, Broadway and Maryland streets.

Winnipeg, Man.—Plans have been prepared for the new two storey machinery

hall to be erected at the Agricultural College, Winnipeg. The building will be 100 ft. square.

Hamiota, Man.—A by-law has been passed by the ratepayers of Hamiota, authorizing the expenditure of \$5,000 for the erection of an addition to the public school building.

Regina, Sask.—The High School Board will call for competitive plans for a \$100,000 collegiate institute building, to be erected in Regina this coming summer.

Kamsack, Sask.—The School Board of Kamsack, Sask., has decided to erect a new school building at this place in the near future. The proposed structure will cost \$5,000.

Saskatoon, Sask.—At a special meeting of the School Board, Saskatoon, the plans of D. Webster were accepted for the erection of a four room addition to the Alexandra school.

Summerbury, Sask.—Tenders have recently been received for a new school building to be erected at Summerbury, Sask. The steam heating plant will be installed. Jas. Alex. McCowan, secretary, Summerbury, Sask.

Prince Albert, Sask.—Competitive plans for a high school building were submitted to the Trustees of High School District No. 2, Prince Albert, Sask., May 11th. The proposed building will cost \$75,000.

Aberdeen, Sask.—The School Trustees of Aberdeen are negotiating for a site on which they propose to erect a new school building this coming summer.

Canora, Sask.—A new school building will be erected at Canora, Sask., at cost of \$5,500. Work will be commenced in the near future. Frank R. Evans, Somersett Block, Winnipeg, is the architect.

Regina, Sask.—The plans of Architects Hutchinson & McGlashen, Regina, have been accepted for the erection of the new Graton Separate school, on corner of Victoria avenue and Scarth street.

Lumbolt, Sask.—Architect W. W. LaChance, Saskatoon, will receive tenders up to May 15th for the erection of a \$4,000 school building at Humbolt, Sask. It will be two storeys high, of frame construction, concrete foundation, single roof, with hot air heating, plumbing, or interior finish, slate blackboards, metallic bath, shining stain.

Whitewood, Sask.—A by-law will be submitted to the ratepayers of Whitewood, for authorizing the expenditure of \$15,000 for the erection of a public school building at this place.

Lumsden, Sask.—The School Board of Lumsden, Sask., is having plans prepared for the erection of a new school building.

Prince Albert, Sask.—A by-law has been passed, providing for \$50,000 for the erection of a school building at this place.

Oventown, Sask.—Tenders were received by A. C. Dewar, Oventown, Sask., up to noon, May 6th, for the erection of a school building at this place.

Edmonton, Alta.—Permit has been issued to the City of Edmonton for the erection of a new school, Horwood, on Hirkness street, to cost \$56,000. Contractors Pheseay & Batson, Architect, R. W. Lines.

Edmonton, Alta.—At the annual meeting of the Executive of the West of the Church of Alberta to be held in Edmonton, the question of purchasing a site for the Provincial Theological College, to be erected in the near future, will be taken up. Rev. John Mackay, B.D., Principal of the British Columbia Theological College, Vancouver, may be addressed for further particulars.

Lamont, Alta.—Mr. McRobert, of Edmonton, Alta., has been awarded the contract for the erection of the new school building at Lamont, Alta., at contract price of \$1,925.

Vermilion, Alta.—Tenders for the construction of a school building at Vermilion, Alta., have been received. The structure will be about 75x92 ft., three storeys high, solid brick masonry. Architect R. W. Lines, Edmonton, Alta., H. V. Fieldhouse, secretary-treasurer, Vermilion, Alta.

Lethbridge, Alta.—Tenders will be received up to May 16th, for the erection of a twelve room and auditorium, brick and stone school building at Lethbridge, Alta. Separate tenders received for installation of Peace-Valdor system of heating and ventilation, in which is to be included all plumbing and tin-smithing used in the building. Separate tender also received for electric wiring and fire alarm bell system. Plans and specifications on file at Room 3, Whitney Block, Winnipeg, Man., C. B. Bowman, secretary-treasurer, School Board; F. B. Rolfsen, Winnipeg, architect.

Daysland, Alta.—Tenders will be received by the undersigned up to noon, May 18th, for the erection of a \$15,000 school building in Daysland, Alta. Plans and specifications on file at office of Bond and W. Lines, architect, Edmonton, Alta.

New Westminster, B. C.—Plans have been completed for the new Westside school, New Westminster. The proposed building will be two storeys in height, and it is estimated will cost \$21,000.

Churches

Toronto, Ont.—Architect Chas. F. Wagner, Toronto, has prepared plans for the erection of a Lutheran church on the corner of College and Markham streets, at cost of \$10,000.

Toronto, Ont.—The congregation of the Bloor street Presbyterian church, has decided to make extensive enlargements to their Sunday school building, and to rebuild the present church organ or purchase a new one. The work has been put in the hands of a special committee with Mr. M. Lainguir as chairman. The estimated expenditures will be approximately \$30,000.

Toronto, Ont.—Architect Chas. F. Wagner, Toronto, has prepared plans for the erection of a \$15,000 Baptist church at the Beach. Work on the building will be commenced in about 10 days' time.

Toronto, Ont.—Permit has been issued to the College street Methodist congregation for the erection of a two storey brick and stone church on the southwest corner of Sheridan avenue and College street at a cost of \$30,000. Architects, G. H. Miller & Co.; builders, Elg & Page.

Guelph, Ont.—Architect W. A. Maloney has awarded the contract for an addition to the Sunday school building of St. Andrew's church, Guelph, to Contractor J. W. Onkes, Guelph, at contract price of about \$5,000, which covers all the work, with the exception of the heating system.

Chatham, Ont.—Plans have been prepared by Messrs. J. P. Wilson, Son & Arnold, for the new St. Andrew's Sunday school building, at Chatham, Ont. Building, which will be of brick, stone and concrete, will contain an auditorium with a seating capacity of eight hundred.

Copetown, Ont.—Tenders will be received up to May 15th for several trades required in the erection of a brick Methodist church at Copetown, Ont. Plans and specifications may be seen at offices of A. W. Beebe, architect, Hamilton, and D. Lawson, Copetown, P. O.; J. A. Hornung sec., Building Committee, Copetown, Ont.

Ottawa, Ont.—Architect V. Gauthier, of Montreal, has prepared plans for the new Sacred Heart Church to be erected in Ottawa, at cost of \$100,000.

Ottawa, Ont.—The congregation of the McKay street Presbyterian church, Ottawa, propose erecting a new church on the site of the present building, at a cost of approximately \$15,000.

Stroud, Ont.—Architect Jas. Thomson, 43 Victoria street, Toronto, is preparing plans and specifications for a church building to be erected at Stroud, Ont. for the Presbyterian congregation. The building will be 30x50 ft., and of concrete monolithic construction, with steel shingles, hardwood interior finish, and art glass windows. Tenders will be received by the Building Committee, Stroud, Ont.

Berlin, Ont.—The congregation of the Lancaster street Memorial church, Berlin, have decided to erect a new brick church this coming summer, on the site of the present building, on corner of Lancaster and Chapel streets. The proposed structure will be 48x61 ft., and it is estimated will cost between \$6,000 and \$7,000.

Stratford, Ont.—Plans have been submitted by Architect S. Russell, for a new church to be erected for the congregation of the Zion Lutheran church, Stratford, on the corner of Erie and St. Patrick streets. Plans call for a building 55x51 ft., with stone foundation.

Erinsville, Ont.—C. J. Speuge, Westport, Ont., has been awarded the contract for the erection of a new tower to the Church of the Assumption, Erinsville, Ont. Architect H. P. Smith, Crown Bank Building, Kingston.

Hamilton, Ont.—At a meeting of the Hamilton Methodist Social Union, it was decided to erect a new Sunday school building at a cost of \$5,500. Rev. J. Treaven, Hamilton, may be addressed.

Dundas, Ont.—The congregation of Knox church, Dundas, will borrow the

sum of \$12,000 for the erection of a new church building at this place.

Grafton, Ont.—St. George Anglican church, Grafton, has been totally destroyed by fire. Rector Rev. C. H. Brooks.

Fort William, Ont.—The congregation of the Anglican church, Fort William, is contemplating the erection of a new church building to cost \$75,000.

Montreal, Que.—Architects Rodden & Montgomery, Inglis Building, Montreal, have prepared plans for a new church building to be erected at the corner of Manco and Prince Arthur streets, for the German Lutheran congregation. The building will be of brick and stone construction, with oak interior finish.

Ancienne Lorette, Que.—Architects Ouellet & Levesque, 115 St. John street, Quebec, have awarded to Piquet & Godbout, St. Hyacinthe, Que., the general contract for the interior finishing of the Roman Catholic church at Ancienne Lorette, Que., at contract price of \$42,000. The building is to be completed by June, 1910.

Quebec, Que.—The Salvation Army building on Alliance street, Quebec, Que., will be thoroughly remodelled in the future. It is estimated that the proposed alterations will cost about \$3,000. Staff Captain Miller, Salvation Army Architect for Canada, Toronto, may be addressed.

St. Fabien, Que.—Architects Ouellet & Lesieur, 115 St. John street, Quebec City, have awarded to A. H. Morin, Trois Pistoles, Que., the contract for the erection of a \$9,650 Presbytery at St. Fabien, Rimouski Co., Que. The building will be of brick construction, 36x24 ft.

Winnipeg, Man.—Plans have been prepared by architect Holman for the erection of a \$6,000 church building on the corner of Homer and Buell streets, for the congregation of St. Margaret's church.

Winnipeg, Man.—St. Joseph's German Catholic church, College avenue, Winnipeg, has been destroyed by fire. The building was valued at \$70,000. It will be rebuilt.

Winnipeg, Man.—Malcolm Bros., Winnipeg, have the contract for a new Methodist Mission building, to be erected on the northeast corner of Sutherland and Euclid. It will be two storeys in height, of brick construction, and will cost \$10,000.

St. Joseph, Man.—The Roman Catholic church, St. Joseph, has been destroyed by fire. Loss \$35,000, covered by insurance to the extent of \$24,500.

Roblin, Man.—The congregation of the Methodist church, Roblin, Man., propose to erect a new church building this coming summer.

Roblin, Man.—Preliminary plans have been prepared by Architect J. H. G. Russell, Winnipeg, for the erection of a new Presbyterian church at Roblin, Man. Plans call for a building containing an auditorium 31x45 ft., with a Sunday school room 28x28 ft.

Vancouver, B. C.—The congregation of Christ church, Vancouver, is contemplating making additions and alterations to their church building at this place, as follows: Extension of building towards the north, to afford increased seating capacity for at least three hundred; extension of school rooms in basement, to double the present accommodation; installation of a new heating and ventilating system, and various other alterations.

Mount Pleasant, B. C.—The Mount Pleasant Presbyterian congregation have decided to erect a new church building on the northwest corner of Tenth avenue and Quebec streets. The building will cost, approximately, \$30,000, and will seat at least 1,600.

Moose Jaw, Sask.—The congregation of the Episcopal Church of England, Moose Jaw, Sask., has decided to erect a new church building on the site of the present structure. It is expected that work will be commenced this fall.

Kimbrae, Sask.—The English church, Kimbrae, Sask., has been completely destroyed by fire.

Lacombe, B. C.—The Presbyterian congregation, Lacombe, will erect a new \$15,000 church building in the near future.

Calgary, Alta.—The congregation of St. Stephen's church, corner Fourteenth avenue and Tenth street West, have authorized the vestry to procure an additional lot west of the present church site, remove the church building to the rear of the property, and build in addition to provide for chancel and vestry. The vestry has also been authorized to ascertain the cost of erecting a new stone church building to seat four hundred, according to plans on hand.

Residences and Flats

Toronto, Ont.—Architects Simpson & Young, 47 Toronto street, have prepared plans for a two and a half storey, 25x

35 ft. residence to be erected on St. Clarence avenue for Mr. E. C. Harvey. It will be of brick construction, hardwood interior finish, two mantels, gas and electric lighting, open plumbing, and hot water heating. Cost \$4,500.

Toronto, Ont.—Architects Stroud & Saunders, Toronto, have completed plans for a two storey residence, to be erected at 47 St. Clair avenue, near Avenue road, for T. P. Stewart, who will construct the building by day work. It will be of brick and stone construction, stain shingle roof, hardwood interior finish, mantels, tile work in bathroom, electric and gas lighting, open plumbing and hot water heating. Cost \$6,000. The building will be two storeys in height, 26x39 ft. ground dimensions.

Toronto, Ont.—Architects Stroud & Saunders, Toronto, have prepared plans for a two family flat building, 21x60 ft., to be erected at 86 St. Patrick street for P. Roach. It will be of brick and stone construction, stone foundation, tar and gravel roof, hot air heating, gas and electric lighting, open plumbing, and mantels.

Toronto, Ont.—Architects Stroud & Saunders have prepared plans for a pair of two storey brick and stone dwellings to be erected at 310-12 Clinton street for T. Jones & Co. The building will have shingle roof, mantels, electric and gas lighting, open plumbing, hot air heating. Ground dimensions 37x44 ft. Estimated cost \$3,500.

Toronto, Ont.—Architect J. H. Galloway has prepared plans for a two and a half storey residence to be erected on Avenue road, at cost of \$6,000, for Dr. W. S. Grimshaw. Building will be of brick and stone construction, with stain shingle roof, hardwood interior finish, mantels, tile work in bathroom, electric lighting, hot water heating. Dimensions 35x35 ft.

Toronto, Ont.—Architect J. H. Galloway, has completed plans for a two storey and attic 25x35 brick residence to be erected at Indian Grove (West End) for J. Male. The building will have stain shingle roof, hot water heating, hardwood interior finish, mantels, electric lighting and open plumbing. Cost \$3,500.

Toronto, Ont.—Architect W. J. Burn, Toronto, has prepared plans for a two and a half storey residence to be erected on Liszt street, for Horace B. Hunter. The first storey will be of brick construction while the portion above will be of timber and plaster work. It will be finished with hardwood interior, mantels, tile work, electric lighting, open plumbing, and hot water heating. The building will contain billiard room and will cost \$5,500.

Toronto, Ont.—Architect W. G. Burn, Toronto, has prepared plans and specifications for a pair of semi-detached dwellings to be erected at a cost of \$6,000, for John Dempster, 183 Dovercourt road. It will be of brick construction, with shingle and tar and gravel roof, hardwood interior finish, two mantels, electric lighting, open plumbing and hot air heating.

Toronto, Ont.—Architects R. J. Edwards & Saunders, Toronto, have prepared plans for a pair of two storey semi-detached dwellings, which are to be erected (in trust) in Toronto. The structure will be of brick with stained shingle roof, hardwood floors, gas and electric lighting, open plumbing and hot water heating. Dimensions of each house, 28 by 19 feet.

York Township, Ont.—Architects R. J. Edwards & Saunders, Toronto, have prepared plans for a two storey, 38 by 31 ft. farm cottage, to be erected in York Township for Mr. W. Cecil Lee, 64 Madison avenue, Toronto. Building will be of frame construction with concrete foundation, hardwood floors, brick fireplace and hot air heating.

Toronto, Ont.—Dr. Geo. E. Cook, 134 Bloor street west, has purchased from Geo. A. Case & Co., Traders Bank Building, Toronto, a lot of 100 ft. frontage on St. George street, on which he will erect a residence at cost of \$10,000.

Thorold, Ont.—Architect A. E. Nicholson, 15 Queen street west, St. Catharines, has prepared plans for an addition to and alterations in the residence of E. Mantley, Mill street, Thorold. The addition will be of frame construction with stone foundation. Alterations include nine interior finish, tile, mantels, metallic lath and plate glass.

Ottawa, Ont.—Architect A. Tracy, 380 Gladstone avenue, has prepared plans for an addition to be built to the residence of Mr. Thad. G. Park, Ottawa. The addition will be two storeys in height, of brick veneer construction, stone foundation, pitch and gravel roof, with hot air heating, electric lighting, enamel plumbing.

Ottawa, Ont.—Architect A. Tracy, 380 Gladstone avenue, Ottawa, will receive

tenders up to May 15th for the erection of a two storey apartment building on Laurier avenue, for E. Richardson, Laurier avenue. The building will be of solid brick construction, concrete foundation, pitch and gravel roof, wood interior finish, hot water heating, electric lighting, enamelware plumbing and ornamental columns or caps. Structure will cost \$4,000.

Ottawa, Ont.—Architect W. E. Noffke, Central Chambers, Ottawa, has prepared plans for two houses to be erected for Capt. Graham, at a cost of \$8,000. The buildings will be of brick construction, with cement floor and basement, shingle stained roof and will have cut stone and mantels.

Hamilton, Ont.—Architect Chas. Mills, Hamilton, has prepared plans for alterations to be made in the residence of J. J. Greene, Hamilton. The alterations include the installation of hot water heating, electric lighting and best porcelain plumbing.

Hamilton, Ont.—Mrs. A. B. Manship, of Hamilton, has awarded the following contracts for the erection of a three storey apartment building on north side of King street, west of Wentworth street, viz.: Brick work, W. E. Yates; carpenter work, Stephenson Bros. The structure will contain two stores on ground floor, and four flats in the two upper stories.

St. Catharines, Ont.—Architect A. E. Nicholson, 15 Queen street St. Catharines, will receive tenders up to May 14th for alterations and addition to brick residence for Dr. J. A. McMahon, King street, St. Catharines. This will include electric lighting, whitewood and pine interior finish, felt and gravel roof, cement walk, cut stone, marble, art glass, and prismatic glass.

Renfrew, Ont.—Architect W. E. Noffke, Central Chambers, Ottawa, is preparing plans for extensive alterations to be made to the residence of Mr. A. Barnett, Renfrew, Ont.

Montreal, Que.—Architects Saxe & Archibald, Montreal, have awarded the following contracts for the erection of a \$10,000 residence in Westmount, for Alex. Falconer, K. C., viz.: Masonry, Stewart & Co., Montreal; heating, Jas. Atchison, Montreal; carpenter work, W. Pauze, Montreal. Building will be three storeys in height, with slate roof.

Montreal, Que.—A. Darling, 104 St. Mark street, has been granted a permit for the erection of a \$10,000 residence. Building will be of pressed brick, with sandstone trimmings, and will be equipped with hot water heating. Architect, J. R. Gardiner, Room 512, New York Life Building, Montreal; contractor, Jas. Morrison, 267 Grey street, Montreal.

Quebec, Que.—Architects Ouellet & Levesque, 115 St. John street, Quebec, have awarded the following contracts for the erection of two brick four storey dwelling houses, on Maple avenue, for N. F. Burroughs, 60 Maple avenue, Quebec, at a cost of \$15,500, viz.: Masonry, carpentry, cement work and plastering, H. G. Languy, Ste. Foy, Que.; electric heating and plumbing, Cls. Blouin, Quebec, Que.

St. Anaclet, Que.—Architects Ouellet & Levesque, 115 St. John street, Quebec, Que., are preparing plans for remodeling the Presbytery at St. Anaclet, Que., for Roman Catholic Congregation, at an estimated cost of \$2,000.

Winnipeg, Man.—Architect Herbert B. Rugh, 927 Union Bank Building, Winnipeg, Man., will receive tenders from May 11th to May 23rd, for the erection of a three storey residence for J. Y. Reid, Winnipeg. Building will be of concrete stone construction, concrete foundation, shingle roof, birch and white interior finish, vacuum steam heating, electric lighting, and will cost \$14,000. Specifications include artificial stone, shingle stain, plate glass, art glass and dumb waiter.

Winnipeg, Man.—Architect Herbert B. Rugh, 927 Union Bank Building, Winnipeg, has prepared plans for a two and a half storey residence for E. B. McInerney, Winnipeg. Building will be of frame and art stone construction, with rubble foundation, shingle roof, hard pine interior finish, hot air heating, electric lighting, and will cost \$4,000.

Winnipeg, Man.—Permit has been issued to Watson Morgan, Winnipeg, for the erection of a four storey brick apartment house on the northwest corner of Garry and St. Mary streets, at a cost of \$20,000. Work will be commenced at once.

Victoria, B. C.—Messrs. Herbert Cuthbert & Co. have bought, for their clients (names not given), site upon which will be erected a four storey brick and concrete apartment building, at a cost of approximately \$100,000. The building will have cement floors, will be equipped with

an elevator, and will be located on corner of Superior and Douglas streets, facing Bercon Hill Park.

Winnipeg, Man.—Permit has been issued to Mrs. H. B. Peterson for the erection of a \$12,000 apartment building on the south side of Wellington Crescent, between Hugo and Helen streets.

Regina, Sask.—Architects Storey & VanEgmond, Regina, have awarded to H. Black the contract for the erection of a \$4,000 residence for W. B. VanEgmond, Regina. Building will be of concrete and frame construction, and will be equipped with electric lighting and hot water heating.

Hotels

Ottawa, Ont.—Architect W. E. Noffke, Central Chambers, Ottawa, has prepared plans for the erection of a four storey and basement, solid brick building, at the rear of Cecil Hotel, and facing Queen street, Ottawa. The ground floor and basement will be occupied by Robertson Bros., as confectionery shop, while the upper three storeys will become part of the Cecil Hotel. Building will be erected by Robertson Bros., for whom J. A. Laurie is local manager. Building will have stone foundation, steam heating and electric lighting, and will cost \$20,000.

Port Burwell, Ont.—The Ironquills Hotel, a summer resort house, Port Burwell, has been entirely destroyed by fire, together with most of the contents. Owner, F. W. Fay.

Leamington, Ont.—The Hoffman House, owned by C. A. Ryall, Leamington, has been badly damaged by fire. The main part of the building, consisting of bar room, sitting rooms, dining rooms and kitchen, were completely destroyed. Loss not known. Mr. Ryall carries insurance to amount of \$5,000.

Ville Marie, Pontiac, Co., Que.—Separate tenders will be received by P. D. Beyer, Ville Marie, Que., up to May 20th, for the construction of an hotel building and for the plumbing and heating system for same. Proprietor reserves brick work. Architect, Chas. Brodeur, Hull, Que.

Boucherville, Que.—Cherron's hotel and general store, Boucherville, Que., have been destroyed by fire. Loss estimated at \$15,000.

Chateauguay Basin, Chateauguay Co., Que.—The Central House, Chateauguay Basin, Que., has been damaged by fire to the extent of about \$6,600, partly covered by insurance.

Halifax, N. S.—At the annual meeting of the Halifax Hotel Company, Limited, it was decided to erect an addition to the hotel building to provide for thirty to forty extra rooms, extra sample room accommodation, and various other alterations.

Winnipeg, Man.—The contract for the new hotel at Winnipeg Beach has been awarded to Carter-Halls-Aldinger Company, of Winnipeg. Contract price, \$30,000.

Carberry, Man.—Mr. Gillespie, of the Royal Hotel, Carberry, proposes to erect a two storey addition from the present building to Third avenue, and will make various other alterations to present building.

Vancouver, B. C.—Tenders are invited up to May 16th for the erection of the new Calori hotel, on the corner of Powell and Alexander streets. Plans and specifications on file at office of undersigned. Farr & Fee, architects, 570 Granville street, Vancouver, B. C.

Vancouver, B. C.—Messrs. Kelly & Murray have been granted a permit for the erection of a stone hotel building on Westminster avenue, Vancouver, at a cost of \$55,000.

Discovery, B. C.—The Gold House, Discovery, three miles from Vancouver, has been totally destroyed by fire. Loss estimated at \$10,000.

Prince Rupert, B. C.—The C. P. R. propose erecting a large hotel building in Prince Rupert, B. C., on a selection of a suitable site.

Gull Lake, Sask.—It is proposed to erect a new summer hotel building at Gull Lake, Sask. Major McPherson, of Bentley, Alta., is the chief promoter.

Edmonton, Alta.—It is understood that an option has been given to a company

of hotel promoters, on lots 61 and 62, Block 4, cor. Fifth and Jasper, who propose to erect a \$60,000 hotel building on this site. F. M. Kamin, Edmonton, is representing the promoters in the enterprise.

Civic Improvements

London, Ont.—The City Council has decided to purchase a lot on the corner of Grosvenor and Waterloo streets, upon which to erect the proposed north-end fire hall.

Montreal, Que.—The Fire and Light Committee, Montreal, will ask for \$100,000 for improvements and alterations to various stations throughout the city of Montreal. Of this sum, \$25,000 is to be used for a station on the upper level of the city and \$30,000 to be expended for additional equipment.

Winnipeg, Man.—A special meeting of the Police Commission, Winnipeg, will be held in the near future, when the question of establishing a Police Patrol system and Suburban Hall will be taken up. It is estimated that the system complete would cost about \$120,000. Alderman Wilson has been prominent in this enterprise.

Winnipeg, Man.—The Fire, Water and Light Committee, Winnipeg, will ask the Controllers to call for tenders for the erection of a new fire hall in Weston, at cost of \$15,000. Building will be located near the corner of Logan and McPhillips street.

Moose Jaw, Sask.—A by-law will be submitted to the ratepayers of Moose Jaw for the purpose of authorizing the expenditure of \$35,000 for a new fire hall to be erected in Moose Jaw, Sask.

Saskatoon, Sask.—A by-law has been passed, authorizing the expenditure of \$25,000 for the erection of a fire hall, with necessary equipment, in Saskatoon, Sask.

Daysland, Alta.—The Town Council of Daysland, Alta., proposes to issue debentures to the extent of \$20,000, \$11,000 to be used for sidewalks, street grading and purchase of fire apparatus; \$9,000 for the erection of fire hall and purchase of fire hall site.

Toronto, Ont.—The Board of Control, Toronto, has awarded to John P. Connolly, the contract for brick pavement of \$7 Grandview avenue, from Logan to \$18 feet west at contract price of \$125.

Toronto, Ont.—The Board of Control has voted the sum of \$8,000 for repairs to the Lake Shore road, \$5,000 of which will be used for a rubble wall, and \$3,000 for the roadway.

Toronto, Ont. The Board of Control has awarded the following contracts for asphalt and bitulithic pavements for city of Toronto, viz.: Parliament street, from Winchester to Wellesley street, asphalt, Constructing and Paving Co., \$4,765; Bolton avenue, Queen to Gerrard, asphalt, \$2,700; Wellington avenue, from Love to 280th City street, asphalt, Godson Co., \$1,813; Armstrong avenue, from Dufferin street to west end, asphalt, C. & P. Co., \$5,573; Roxborough street, from Yonge street to 2180 feet east, bitulithic, Warren Co., \$14,449.

Toronto, Ont.—The following pavement contracts have been awarded by Board of Control: Seaton street, Queen to Carlton, asphalt, Godson Company, \$12,830; Bolton avenue, Queen to Gerrard, asphalt, Warren Co., \$9,574; Napier street, from Murray to west end, asphalt, Construction & Paving Co., \$1,300; Huxley street, Tyn-dall avenue to Jameson, asphalt, Godson Co., \$7,750; Murray street, Cser Howell to Ordie street, bitulithic, Warren Co., \$4,465; Poplar Plains road, MacPherson to Edmund street, bitulithic, City Engineer, \$11,205; Humbolt street, Poplar Plains road to Warren road, bitulithic, Warren Co., \$3,888.

St. Thomas, Ont.—The Board of Health, St. Thomas, has recommended that a garbage destroyer plant be established in this city, and a by-law to this effect will shortly be submitted to the citizens. It is proposed to provide for a fifty-ton-a-day destroyer plant, to be located at the Light, Heat & Power Works.

Stratford, Ont.—The Board of Works has recommended the construction of several new sidewalks and sewers in Stratford this coming summer and the paving of Brunswick street with vitrified brick.

Peterborough, Ont.—R. Hicks & Co., Peterborough, have been awarded the contract for supplying the city with

cement for sidewalks, etc., for year 1908, at contract price of \$1.81 per barrel.

Dunnville, Ont.—At a meeting of the Town Council, Dunnville, Ont., it was approved that Chesnut, Canal and Lock streets be paved with macadam and tar macadam. It is estimated that this work would cost \$12,000.

Toronto, Ont.—Tenders will be received, by registered post only, addressed to undersigned, for the paving of streets for following works on different streets in Toronto, specifications of which may be obtained at office of City Engineer, viz.: Asphalt pavements, bitulithic pavement, vitrified block pavement, grading, concrete curbs, concrete sidewalks, and sewers. Joseph Oliver (Mayor), Chairman Board of Control, City Hall, Toronto.

St. John, N. B.—The following contracts have been awarded for street materials for the city of St. John, N. B., viz.: Asphalt, Robt. Redford Co., Montreal, \$4.65 per barrel; sand, Herbert Creighton, \$1.15 per load of ten barrels; coal, J. S. Gibson & Co., St. John, N. B.; paving blocks, Randolph & Baker, St. John, 4c., 3,000 yards.

Glace Bay, N. S.—The contract for the construction of a breastwork at Dominion No. 6 Beach, has been awarded by the Dominion Government to Mr. Williams, Glace Bay, N. S., at estimated cost of about \$10,000. Work will be commenced at once.

More Daming of the Nile

SIR WILLIAM WILCOCKS in an address on the Building of Nile Reservoirs, concludes that the construction of a barrage at the junction of the White and Blue Niles at Khartoum provides the principal engineering solution of the recurrence of low Nile floods, a danger minimized, it is true, by the construction of the Assuan dam, but still a peril to Egypt.

He considers that an expenditure of something under three millions sterling would suffice for works with a storage capacity of three million cubic meters of water, a result that would greatly exceed what has been accomplished by the Assuan dam. Out of the six milliard cubic meters of water needed for Egypt the Assuan reservoir will only be able to supply two.

For the other four we shall have to turn to the terminal reach of the White Nile, with its wide channel, about 1,000 kilometers in length, with no appreciable slope in 500 kilometers, and one of 1-100, only in the remaining 500.

When Egypt needed basin irrigation—through a period of 6,000 years—the mud solvent waters of the Blue Nile, aided by the still more turbid waters of the Atbara, supplied her needs. When today we need to store clear water for summer use on an immense scale, the White Nile is ready with its reservoir-like basin to meet every need not of Egypt alone, but of the Soudan as well. The White Nile, between Lake No and Khartoum is very nearly a lake in flood, and so it would stay for ever if the Blue Nile were subject to a perpetual flood. Between the low summer and high flood levels there is a difference of eight meters.

What is needed, therefore, is masonry works of such strength as will keep this water impounded where it lies when the Blue Nile has delivered its flood, just when Egypt needs it, not superabundantly in October, November and December (when there is no call for it) and in deficiency in April, May and June (when the country is crying out for water), but vice versa.

Whatever works are carried out the necessity of a reservoir at Assuan remains untouched. The question was gone into thoroughly at the time, and the opinion then come to still holds good—namely, "We have concluded that it is absolutely necessary, in the interest of irrigation, to have near the head at the point where the Nile enters Egypt a reserve of water that may meet whatever contingencies arise."

These contingencies might arise from the fact that some of the more important summer crops are incapable of standing a ten-day drought, while the summer rains charge high up the Nile would take many days to reach Egypt, and might sometimes arrive too late.—London Times.

MONTREAL BUILDERS' SHOW

BUILDING materials and appliances were displayed to excellent advantage in the several attractive and well arranged exhibits at the Second Annual Builders' Show held at Montreal under the auspices of the Montreal Builders' Exchange, during Easter week. The several firms that took space in the coliseum at this exhibition are to be highly complimented upon the expense and trouble they went to in fitting up and decorating their booths in a manner that not only showed their products off to excellent advantage but rendered the whole show attractive and entertaining. Architects and contractors found the exhibits most interesting and it is to be regretted that there was not a much larger out-of-town attendance. The expense involved on the part of the exhibitors warranted it.

The Montreal Builders' Exchange have great reason to be highly grateful to contractors, building material dealers and manufacturers of building appliances for their very liberal patronage.

CORKBOARD INSULATION

CORKBOARD was the predominating factor in the decorative scheme of the booth at which the Armstrong Cork Company, 425 Coristine Building, Montreal, displayed its insulation and pipe covering to the many visitors in attendance at the Montreal Builders' Show. The exhibit was decidedly striking in its general make-up, the products of this firm seeming to be omnipresent.

The floor, steps and counter of the booth were all of corkboard, while placed around the stand were specimens of this material showing its application for insulating purposes and pipe covering. The special advantage of using the "Nonpareil" brand in cold storage building, packing house, breweries and refrigerators, was demonstrated in a most efficient manner by a capable staff.

The patronage which the company has enjoyed since the inception of its Canadian office has greatly increased under the management of Mr. W. G. Kent, whose knowledge of refrigeration and insulation is second to none in Canada. The unexcelled quality of Armstrong products places them in great demand where materials of this na-

ture are required, and the ready manner in which "Corkboard" is being adopted, only substantiates the many claims made for it. Booklets, estimates and other information will be sent upon request.

BUILDERS' AND CONTRACTORS' SUPPLIES

POSSIBLY the largest and most elaborate exhibit at the Builders' Show was the display of Francis Hyde & Company, of Montreal. Their booth was decorated in a manner worthy of the high class of goods this firm carries, and the various lines of materials and supplies were arranged so as to appeal most strongly to the practical eye of the builder and contractor.

Many of the salient lines of the decorations were worked out by the utilization of various stock products. The floor of the booth was constructed of imported Welsh quarries, laid in black mortar, and the novel idea was further carried out by a display of drain pipes, arranged so as to form a railing around the exhibit, and attractively set off with palms and potted flowers.

One of the features of this huge exhibit was the building brick manufactured by the well known Harbison - Walker Refractories Company of Canada, which this firm represents. The brick can be supplied in thirty-five different

shades, and it is now being introduced to the trade in the Dominion. In the short time this product has been in the market it has met with great favor among the architects and builders, and will be used in several buildings of note this summer.

Among the many lines displayed the samples of art stone, manufactured by the Canadian Art Stone Company, another concern represented by this firm, demonstrated the excellent quality of this product and plainly showed the rapid strides that have been made in the advancement of this industry.

In addition to the regular lines of wheelbarrows shown a special line of barrows and concrete carts, for which this firm are the sole agents in Canada, commanded the attention of many of the contractors present, and resulted in a number of orders being placed at the booth. These

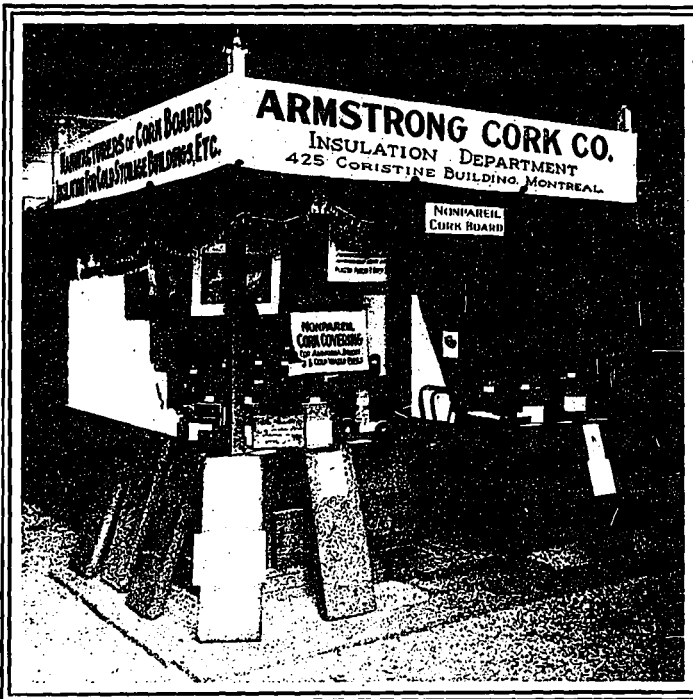


EXHIBIT OF THE ARMSTRONG CORK COMPANY AT RECENT BUILDERS' SHOW, MONTREAL.

barrows are the result of a successful effort on the part of the Lansing Wheelbarrow Company to provide the contractor with a barrow, which will meet their special needs, and which will do the maximum amount of work at the minimum amount of labor.

The brands of cement included in the extensive line of this firm are in keeping with the high standard of their other products, being the "Iron Clad," one of the best known American brands, the "International," one of the leading Canadian brands, and also the "Lafarge," the only non-staining cement on the market, which is so successfully used in the manufacture of art stone.

All in all, Francis Hyde & Company's exhibit was a most creditable one. It represented a display in which neither time, labor nor expense was spared and which was symbolic of the progress that has been made in builders' supplies during recent years.

PRESSED BRICK AND ROMAN STONE

UPON entering the coliseum in Montreal, in which the Builders' Show was recently held, the first exhibit that met the eye was that of The Milton Pressed Brick Company, showing a large brick fireplace constructed of their well-known pressed brick. Both from the standpoint of design and quality of material used, this large fireplace in the entrance served as a most fitting and appropriate introduction to the nature of the show within.

In the exhibit of T. A. Morrison & Co., Montreal, a large arch was built of Milton Pressed Brick, trimmed with Roman Stone. The combination presented was most striking, and suggested the beautiful effects possible in architectural design and color scheme, through the use of these two well known products.

Roman Stone has been used in Canada for the past number of years in the construction of some of our finest buildings, not only as a facing, but its color and texture is such that it serves as a most excellent trimming in the shape of cornices, columns, lintels, etc. The Roman Stone Company, as well as the Milton Pressed Brick Co., are represented in Montreal by T. A. Morrison & Co., which firm has been highly successful in having these two well known products specified and used in the construction of many of Montreal's largest buildings.

BOILERS AND RADIATORS

IN keeping with the aggressiveness which has marked their broad business policy, Warden, King & Company, 157 Craig street, Montreal, for whom Cluff Bros., Toronto, are the selling agents, had a most complete display at the Montreal Builders' Exhibition.

Occupying a prominent position near the main entrance, their booth proved of great interest to the architects, heating contractors and plumbers present, as included in the exhibit was every improvement known to the modern heating science. An array of Viking and Daisy boilers and bath heaters of the latest types, in various sizes, were advantageously arranged to display their many exceptional points.

Especial attention was given the "1908" Daisy boiler, owing to its several new features which greatly add to the excellent qualities that have given this boiler so enviable a reputation during the past twenty-five years. The durable, economic and heating advantages of the Viking Boiler, a highly reliable apparatus, also appealed most strongly to the daily throng.

The company also exhibited a fine line of King Radiators, manufactured at the new King Radiator plant at Toronto. These radiators are unexcelled in quality, workmanship and design, and the company invites prospective customers to compare the rating of their products with that of other makes. They are made in plain and

ornamental designs, and in sizes to meet any condition. In addition to the above, the company also showed a wide range of plumbing and heating goods, which they manufacture for the trade.

DOMESTIC AND FOREIGN PRODUCTS

A VERY attractive exhibit of building supplies at the recent Builders' Show was that of E. F. Dartnell, 157 St. James street, Montreal. This firm displayed a full line of face brick in a great variety of color and finish, having brick from Canada, the United States, England, France and Belgium. In ornamental terra cotta, red and buff products from the Toronto Pressed Brick and Terra Cotta, and also American makes in various colors were shown.

Samples of terra cotta fireproofing, such as this firm recently supplied for the Canadian Bank of Commerce new building in Montreal, and for the Terminal station at Hamilton, were also advantageously displayed. In French goods the samples of "Les Gres de Bigot" terra cotta tiles, enamelled brick, etc., made by Bigot & Company, were of an excellent quality and proved highly interesting to the many who examined this exceptional line.

The display further included specimens of stones and marble from Canada, the United States, Great Britain and France, among which was a very fine panel from the Perry-Matthews-Buskirk Stone Company, of Bedford, Indiana, showing machine cut work. There was also a complete exhibit of roofing and floor tiles, paving brick, etc., and the products of Toch Bros., New York, including R. I. W. damp resisting paints, cement filler, cement floor paint and other specialties for which this firm has the Canadian agency.

Among the brick manufacturers represented by E. F. Dartnell are the New York Pressed Brick Co., the Kittinging Brick and Fire Clay Co., the Hydraulic Pressed Brick Co., the Toronto Pressed Brick and Terra Cotta Works, Bechtels, Limited, etc.

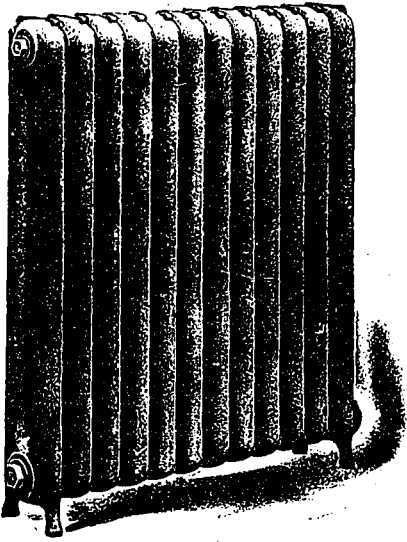
DOMINION BRAND ROOFING

IMPORTANT elements in every building are roofing, building paper and felt. No matter how well a building is constructed in other respects, it is defective if not properly equipped with these essentials. The purpose of good roofing is to protect the interior of the structure and to assist in maintaining a normal temperature, while the building paper and felt, aside from serving in a like manner, further act as agencies to minimize the transmission of sounds. Therefore, too great a consideration cannot be given these necessary features.

One of the best known manufacturers of products of this kind is Lockerby & McComb, 65 Shannon street, Montreal, their vast line comprising tarred felt, building paper, coal tar and pitch carpet felt and cold storage lining. Their "Dominion Brand" of ready roofing has won a universal endorsement among the builders of the country, for its durable and waterproof qualities, and their "Good Luck" and "Shield Brand" of inside and outside linings have likewise been accorded the highest testimony for the manner in which they retard the passage of heat, cold and sound.

This firm also makes a specialty of a "hopper roof" for flat roof construction. This particular style is specially adapted for keeping the surface free from snow and ice, as all moisture gravitates to the centre and is carried off through a drain to the sewer. Their double roof with from three to four inches dead air space, is a style particularly advantageous where warmth is considered.

The display of this firm at the Builders' Show demonstrated the practical application of their various products.



KING RADIATORS

All Radiators Look Alike

is a statement you often hear made about Radiators in general, **BUT** when this remark was coined **KING RADIATORS** had not been evolved—

All OTHER Radiators Look Alike

is what the statement will now have to be changed to, for the **KING** is modelled on such graceful and scientific lines,—that

No OTHER is Like IT

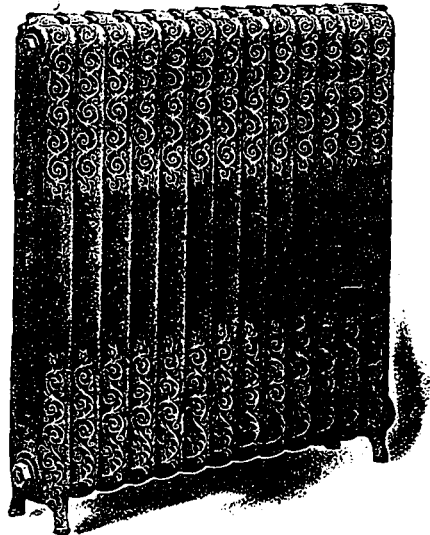
They will be found to measure up to the full rating quoted—the ornamentation is Rich, Artistic, and consistent in all styles,—they are constructed with the greatest care and precision, of the best materials money can buy, and at

**THE FINEST
PLANT
IN AMERICA**

Catalogue on Request

CLUFF BROTHERS

LOMBARD STREET, TORONTO



Selling Agents
for : : : **WARDEN-KING, Limited**

A feature of their exhibit, which attracted much attention, was a bungalow, showing the use of these materials in this style of construction, which is becoming so popular among votaries of camp life.

AN ATTRACTIVE DISPLAY

OWING to its unique arrangement the exhibit of the Dominion Radiator Company proved to be the cynosure of attraction to many who attended the Builders' Show recently held at Montreal. Surrounding this booth was an artistically fashioned fence consisting of Princess Pattern wall radiators. Aside from a full line of radiators, designed to meet every conceivable condition, this firm displayed one of the new type of Safford boiler, together with a large sectional Triumph steam boiler, a type which is largely replacing the horizontal tubular boiler by reason of its portability and splendid direct heating service.

The extensive line of radiators manufactured by this concern includes fifty distinct patterns, each pattern being made in sizes ranging from twelve to forty-five inches in height. So wide is the range, in fact, that prospective customers experience no difficulty in obtaining exactly what they want in this line. This company has a large list of testimonials from architects and owners as to the merits of its boilers and radiators, which, together with



DOMINION RADIATOR COMPANY EXHIBIT AT THE MONTREAL BUILDERS' SHOW.

literature, price lists and estimates, will be sent upon request by addressing the Dominion Radiator Company, in care of its Toronto, Montreal or Winnipeg offices.

ONE MILLION BARRELS ANNUALLY

THERE is possibly no building material in which the public is more interested at the present time, and is anxious to learn about than cement, and it is a foregone conclusion that any demonstration of the possibilities of cement, or the uses to which it may be put will be attended with much interest.

Realizing this fact, the Lakefield Portland Cement Co., of Montreal, fitted up their booth at the Montreal Builders' Show as a cement testing laboratory, in which brickets of the various shipments made by them were tested to the attentive interest of those in attendance at the Exhibition. This firm, whose plants are at Lakefield, Ont., and Montreal, manufactures the "Monarch Brand" of Portland cement, and have an annual capacity of one million barrels. The product is of the highest quality, and fulfils every requirement of any of the standard specifications for cement. Mr. Kilburn, secretary-treasurer, reported a successful week at the exhibition, during which time several orders were taken for large shipments of their cement to be delivered at various parts of the Dominion.

The crowd constantly surrounding the exhibit of this firm, fully demonstrated the advantage of animated demonstrations in a show of this nature.

ROOFING AND BUILDING PAPERS

THE architect or contractor who had the opportunity to visit the Builders' Show at Montreal could not help but be impressed with the important position occupied in the building industry by the manufacturers of the various types of roofing now on the market.

Among the several roofing manufacturers who exhibited their product at the Montreal Builders' Show was Alex. McArthur & Co., 82 McGill street, Montreal. This is one of the oldest firms in the Dominion of Canada, manufacturing ready roofing and building paper, and their exhibit was arranged so as to tastily show to advantage their various brands. A large wash drawing, showing a bird's-eye view of their plant, was one of the features of the booth, and served as a revelation of the great importance of this industry.

This firm manufactures, in addition to building papers, linings and tarred felt, an especially meritorious roofing known as "Black Diamond Brand," the reputation of which is firmly established in practically every part of Canada.

STEEL BURGLAR SAFES

IT will be of interest to our readers to learn that the steel burglar safe installed in the new branch bank building erected at West Toronto for the Bank of British North America illustrated and described in this issue was manufactured and installed by J. & J. Taylor, of Toronto, and was their style No. 57. This safe is fitted with their new improved crane hinges, eccentric levers and double rubber packing. The inside compartments can be arranged as desired and the inner doors secured with either key or combination locks. The outer door is fitted with chronometer time lock.

It is made of alternate layers of iron, best five-ply welded chrome steel and iron, and clear steel, with solid steel corners. The doors are tongued and grooved to prevent wedging, and locked with either one or two back-shaft four-wheel combination locks. The combination locks on outer door are fitted with our new patent built-in enlarged centre spindles, ground into the door to prevent the introduction of explosives, and which can neither be driven in nor pulled out. All the bolt work, lock and hinge trimmings, and eccentric levers are highly polished and electro-plated.

QUEBEC BRIDGE REPORT CONCLUDED

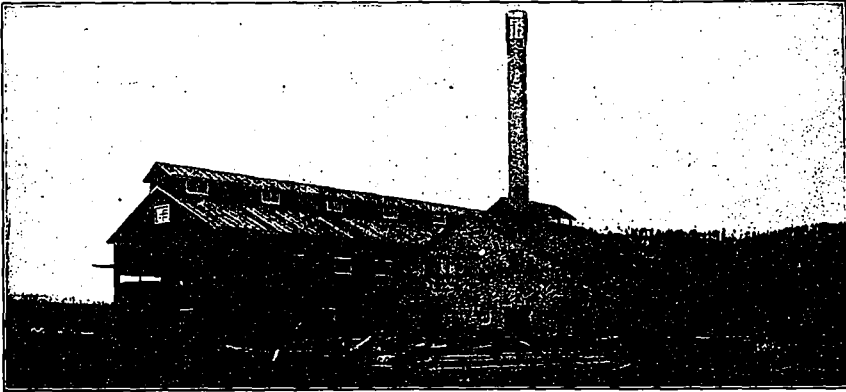
(Continued from page 55.)

"The lack of precise knowledge on this subject has been discussed in other appendices."

As a whole the report is without question the most valuable treatise on the theory and practice of modern science in bridge construction in existence and the members of the commission have given the engineering world a work that will be consulted as the authoritative text on this important branch of civil engineering for many years to come.

This, however, in our opinion does not detract from the absurdity of conducting such an exhaustive investigation into the cause of so great a disaster, without even making an attempt to determine with whom the responsibility rests for the failure of the Quebec bridge. We cannot understand how the commission could intelligently determine the cause without fixing the responsibility. The report has still to come up before Parliament for discussion and it will be interesting to know just what additional facts this discussion will bring out.

ECLIPSE ROOFING



SAW MILL COVERED WITH ECLIPSE ROOFING

MAKES A GOOD ROOF



ECLIPSE ROOFING is sold by dealers generally, and is backed by an experience of nearly forty years in the manufacture of Roofing.

EXPERIENCE COUNTS. Eclipse has the benefit of this long experience, being made from start to finish in one mill.

QUALITY OUR STANDARD

HOW MADE. The foundation or base of Eclipse Roofing consists of a Wool Felt especially made for this purpose. After thorough testing it is treated with a special mineral-caoutchouc compound having a high melting point—220° Fahrenheit, and is coated by a hot process with a special powdered asbestic lubricant. It contains no coal tar and imparts no taste or odor to water. Steam, acids, gases, or condensation do not change it. Remains unaffected by the water for years.



PUT UP IN ROLLS WITH DEALER'S NAME ONLY

Send for Samples

The Canadian Fairbanks Co., Ltd.
MONTREAL

TORONTO

ST. JOHN

WINNIPEG

CALGARY

VANCOUVER

BEAVER BRAND FLOORING

THE SEAMAN KENT COMPANY, of Toronto and Meaford, Ont., Canada's largest manufacturers of hardwood flooring, exhibited their product in a tastily arranged booth at the Montreal Builders' Show. Four panels of their "Beaver Brand" flooring were shown in a large frame, and architects, as well as prospective builders, showed great interest in this beautifully finished product. The exhibit was in charge of Mr. Lowrie, eastern representative of this firm, who fittingly entertained many of the friends of "Beaver Brand" Flooring.

Henry Morgan & Co. handle the product of the Seaman Kent Company in Montreal.

IDEAL CONCRETE BUILDING BLOCKS

THE development of concrete blocks the past few years has been so marked as to almost entirely dissipate the one time prevalent idea that an artistic structure could not be built of this material. Architects who until recently were greatly adverse to this form of construction are now leaning more kindly towards it, owing to the fact that the better class of manufacturers of concrete block machines are placing in the hands of the contractors a machine that will meet the requirement of the designer in every respect.

The rigid uniformity of rough-faced blocks so conspicuous in structures a few years ago is now being superseded by a more varied surface, a thing which has practically



EXHIBIT OF THE IDEAL CONCRETE MACHINERY COMPANY AT THE CEMENT USERS' CONVENTION, RECENTLY HELD AT BUFFALO, N. Y.

overcome the artificial effect which heretofore existed. At one time it was necessary for the architect, in order to get a satisfactory result, to design a structure that would adapt itself to the size and character of the blocks. Today the order is reversed, as with a properly equipped machine, with its adjustable moulds and series of face plates, not only a better class of blocks are turned out but blocks that will adapt themselves to door and window openings and corner work in a most ready manner.

Together with the development of the concrete block, it can be noted the progress that has been made in other cement products, such as caps, columns, balustrades, etc.

Nothing more fittingly illustrates the advance in all of these lines than the accompanying half-tone, showing the exhibit of the Ideal Concrete Machinery Company, of South Bend, Indiana, and London, Ontario, which was one of the features at the annual convention of the National Cement Users' Association, recently held at Buffalo, N. Y.

This company is the sole owner and maker of the Ideal Hollow Block Machine, and by its system, solid, hollow

and veneer blocks, continuous, horizontal, vertical, or staggered air space blocks, dry, medium or wet, can be manufactured.

The meritorious character of the Ideal machine has given it so broad a market that it can be found in almost every country in the world. An interesting little publication, called Idealite, issued monthly, will be mailed by the company upon request, to anyone seeking data on concrete block construction.

It will be of interest to our readers to learn that Mr. Pulfer, manager of this firm, was one of the most active organizers of the recently formed Canadian Cement and Concrete Association, of which he was elected to the office of vice-president.

A HUGE ARMATURE RING

THE wonderful strides that have been made in the manufacture of electrical appliances, which have come to be a part of our industrial expansion, is far beyond the conception of the average person. An idea of the mammoth dimensions of some of the electrical machinery used to meet certain conditions, can be obtained from the illustration in the advertisement of the Gas and Electric Company, in this issue.

It shows one of the 3,000 kilowatt armature rings that was installed in the electric light station of the London Common Council at Greenwich, London, by The Electric Construction Company, Wolverhampton, Eng., for whom the Gas & Electric Company are the Canadian agents. Thirty of these units are included in the equipment of this plant, each unit being coupled on either side to a steam engine of 2,000 H.P. capacity. This large contract was secured in the keenest competition, merit and price deciding the award, and the machinery has proved absolutely satisfactory in design, construction and efficiency. The Electrical Construction Company is one of the most successful firms known, having installed their machinery all over the world.

The Gas & Electric Co. are in a position to supply almost any size alternating current machinery either for electric, steam or hydraulic driven machinery, as well as direct or alternating current motors. All the direct current machinery manufactured by this company is of the very latest design in which commutating poles are used, thus the output of the machinery being determined by the heating temperature rise and not by sparking. The company has several new designs and patents in alternating current motors, which have proved to bring about the highest efficiency at the cheapest cost.

The Gas & Electric Power Co. are also the sole agents for Messrs. Feranti, Limited, of Hollingwood, Eng., the well known specialists in meter design and high tension switch-board construction. This concern's meters have passed the recent severe test of the Board of Trade in England and they conform in every way with the regulation of the Canadian Government's Inspection of Weights and Measures. The year's supply of one of the largest municipalities in the Dominion will be furnished by the company, the contract being awarded strictly on the efficiency and low cost of the meter. These meters are in use all over the world, in the British Isles alone the company having 60 per cent. of the business.

Milan, Italy, which we learn has the best testing laboratory in the world, has also adopted this meter, some 10,000 instruments being supplied. The company's high-class switch-boards are manufactured for either low or high tension work. A good example of the high tension switch-board may be seen at the Glasgow Corporation, where the company has furnished the entire equipment. We also understand that the company will take in hand the complete installation of municipal plants of any size. For further information, estimates, etc., address The Gas & Electric Company, at either Montreal, Ottawa or Toronto.



“THE NIAGARA BAR”

IN a previous advertisement in “Construction” we went into the question of low-cost construction in NIAGARA SYSTEM of Reinforced Concrete. In this number we wish to give particular attention to the SIMPLICITY, and what we call the “ELASTICITY OF APPLICATION” of the NIAGARA BAR to the problems of construction in concrete.

☐ Under the “Niagara System” the shear members may be attached to any form of plain or deformed tension bar now on the market with only slight variation in the shape and size of the clip such as “Ransome,” “Johnson,” “Thacher,” “Twisted Lug,” or “Kahn Cup,” bars, making the simplest method of attaching stirrups which it is possible to devise, and increasing the efficiency of any one of these bars.

☐ We have a preference for COMMERCIAL PLAIN BARS under ordinary condition, usually in squares and flats, and have found that the results are satisfactory in actual practice. Beyond this broad nature and simplicity of attachment of shear members to many types of tension bars is the important point of the varying length of the shear members, which at all times may be sufficiently long to enable homogeneous action in the stem and tee of a T beam.

☐ The T beam is the type most important and most used in concrete, and the reinforcement against shear should in all cases extend up into the floor slab. In our design of the Niagara Bar we use three quarters of an inch as the standard dimension in width, thereby making it possible, at all times to design in economical sizes of beams. Increase of steel area is made by increasing in depth of bar, in accordance with the logical development of a beam for heavy loading.

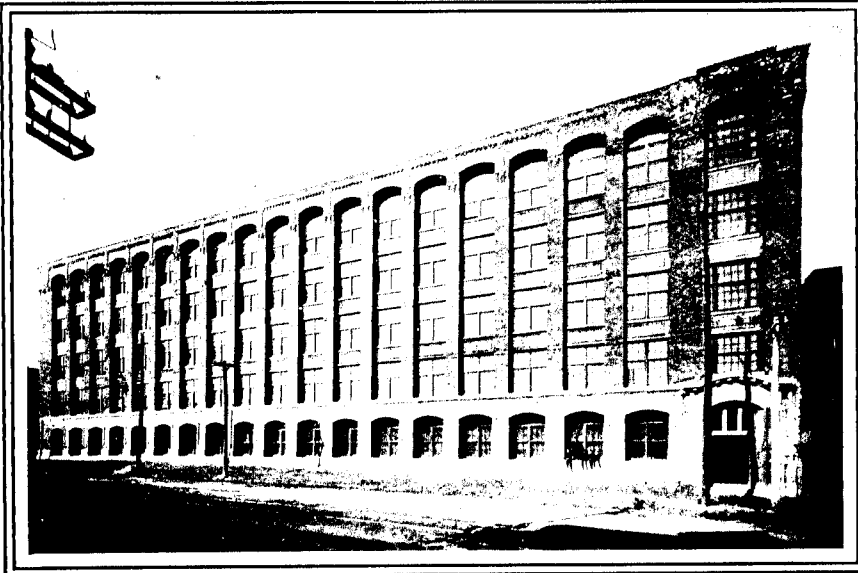
☐ We have the most ECONOMICAL reinforcing bar on the market. The NIAGARA BAR is of the HIGHEST EFFICIENCY. Our EXPERIENCE and SERVICE is at your command.

PITTS & ROBINSON

Architects and Engineers

IMPERIAL BANK CHAMBERS

NIAGARA FALLS, = = CANADA.



The
Cast Iron
Columns
Iron Stairs
Fire Escapes
 And All Ornamental Iron
 In this Building
 Was

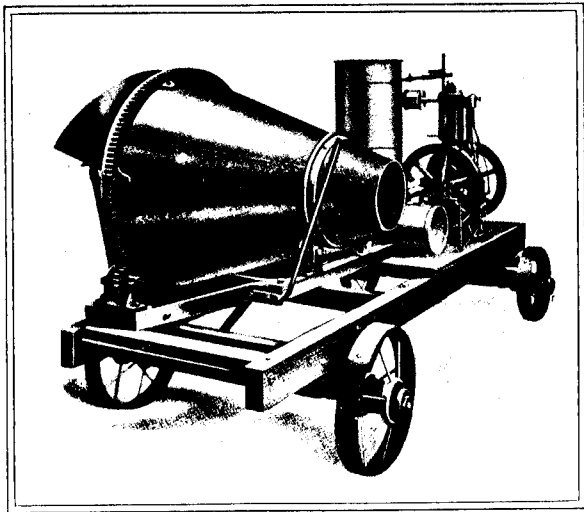
ADDITIONAL FACTORY OF THE STANDARD SHIRT CO., LIMITED.
 ARCHITECTS, MESSRS. BROWN & VALLANCE. E. G. M. CAPE, GENERAL CONTRACTOR.

Supplied by Us

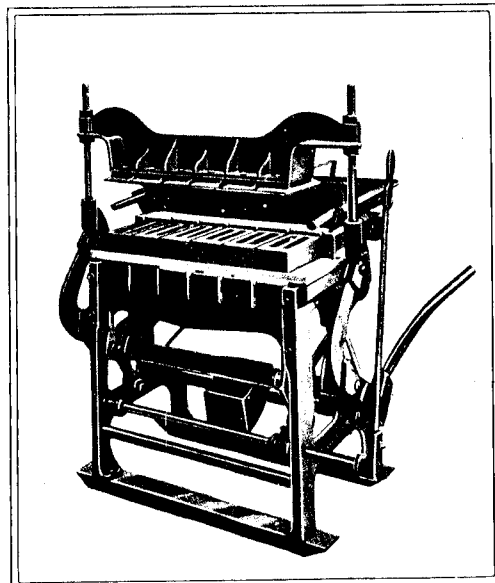
We have also equipped with Structural and Ornamental Iron the following buildings :
 Coristine Bldg., Williams & Wilson Warehouse, Canadian Spool Cotton Factory, General
 Hospital's Laundry and Power House, Crescent Turkish Bath, L. O. Grothe's Factory,
 Bennett's Theatre, Wabasso Cotton Mills (Three Rivers), and several others.

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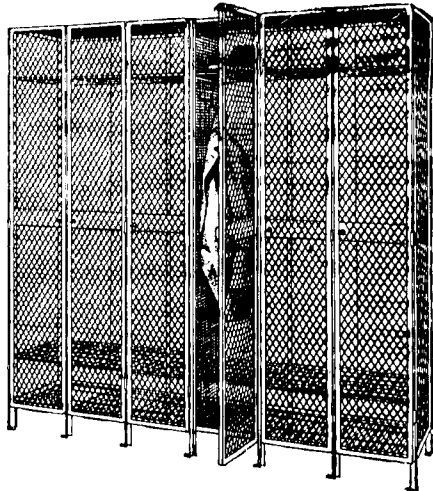
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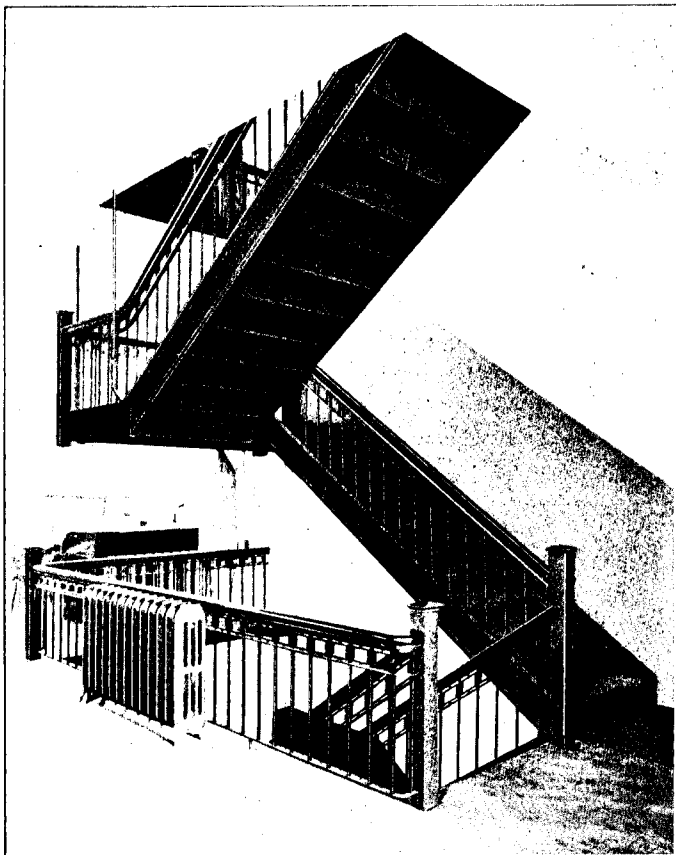
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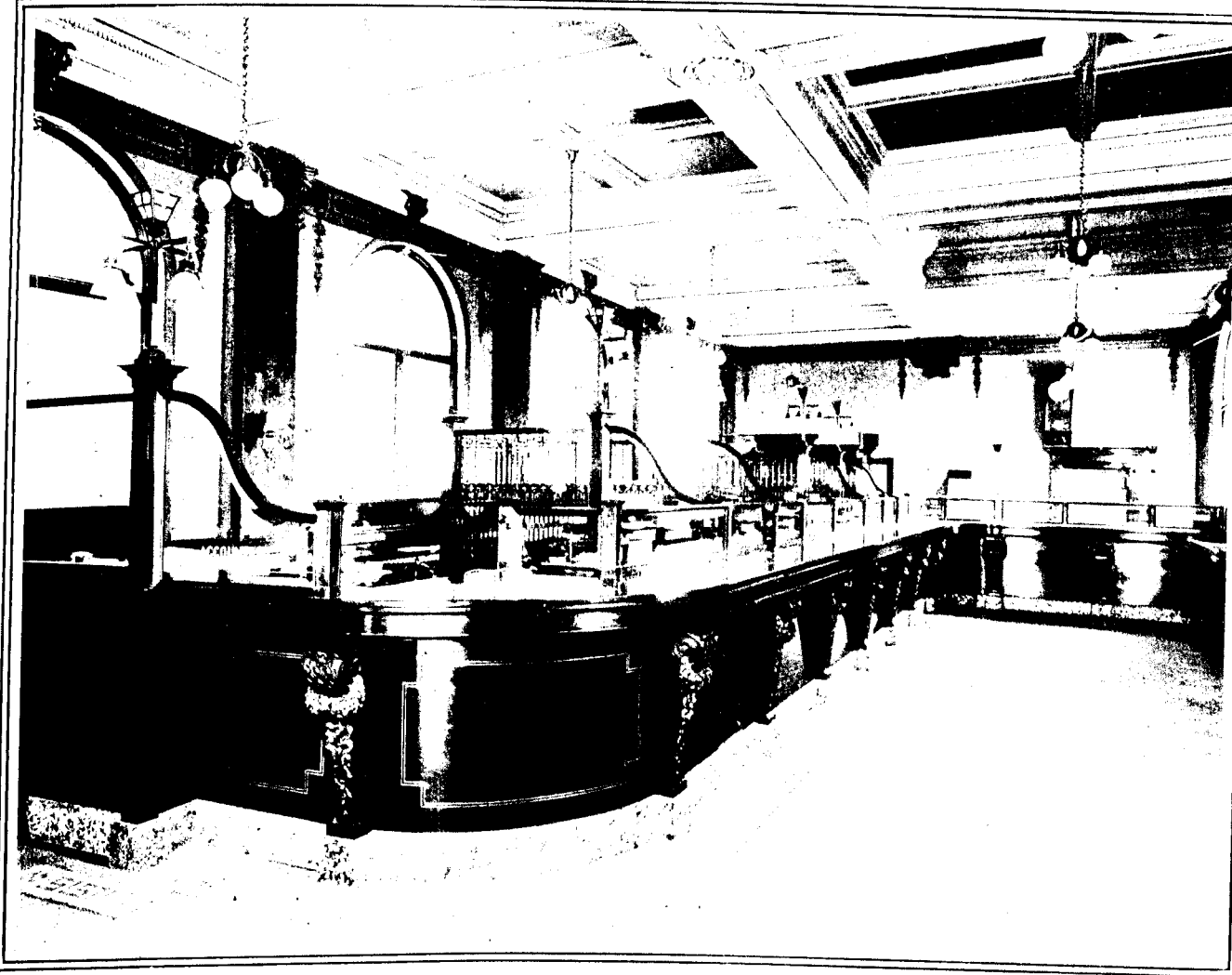
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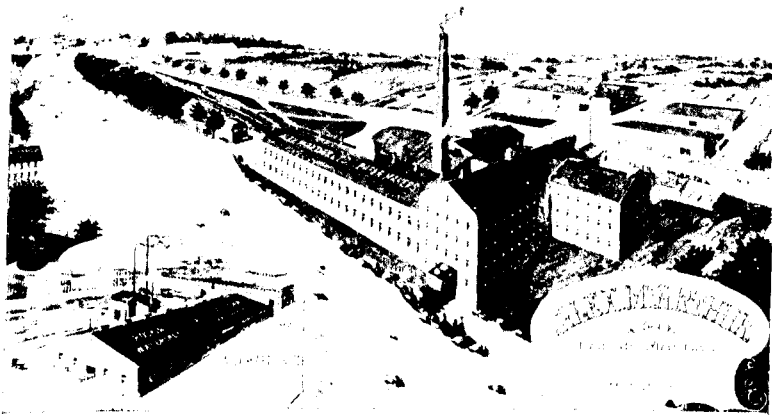
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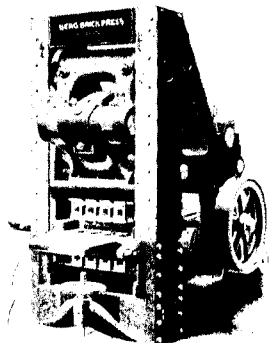
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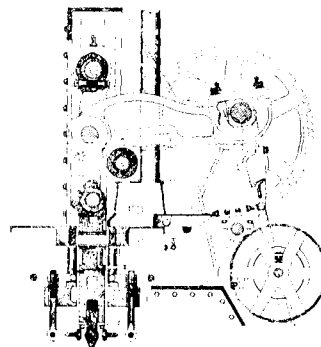
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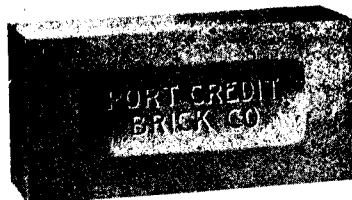
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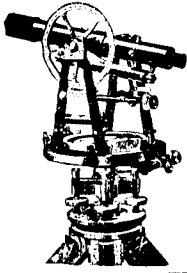
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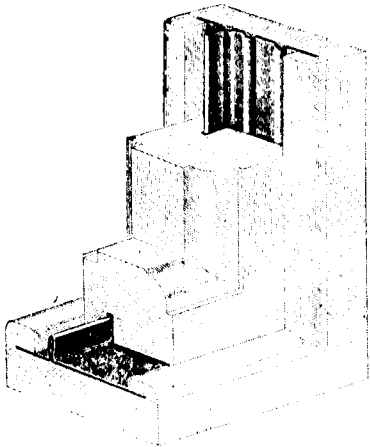
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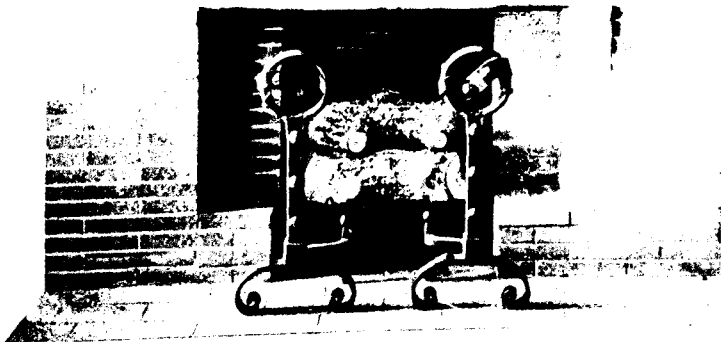
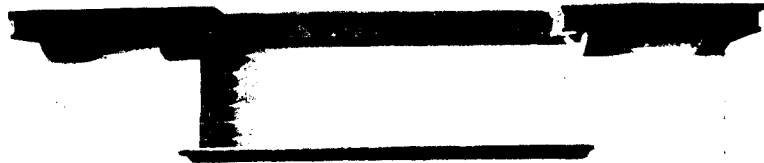
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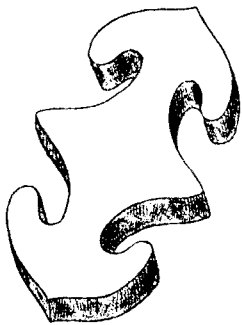
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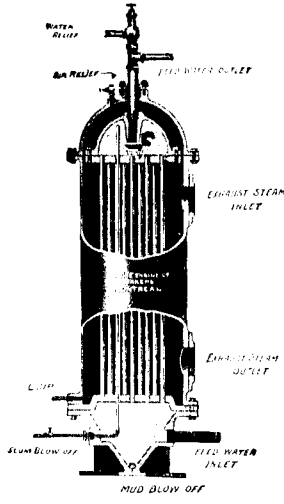
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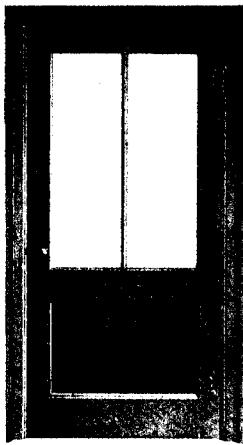
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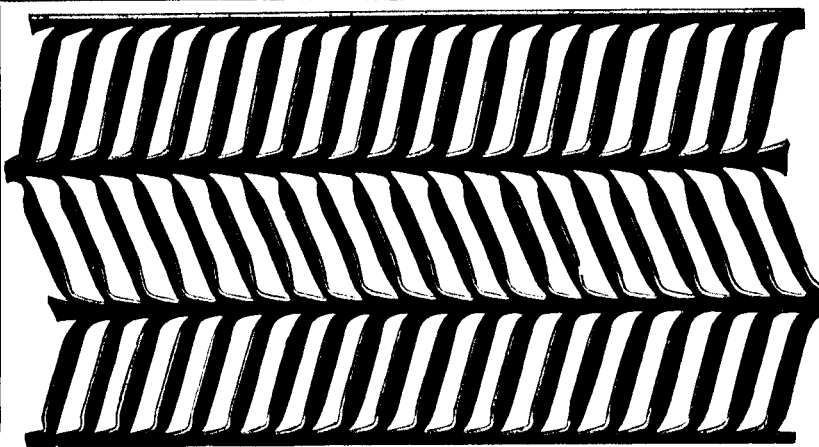
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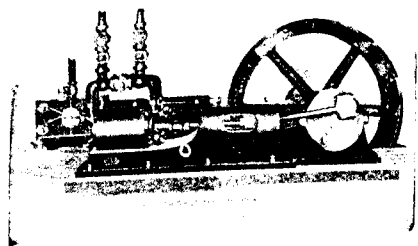
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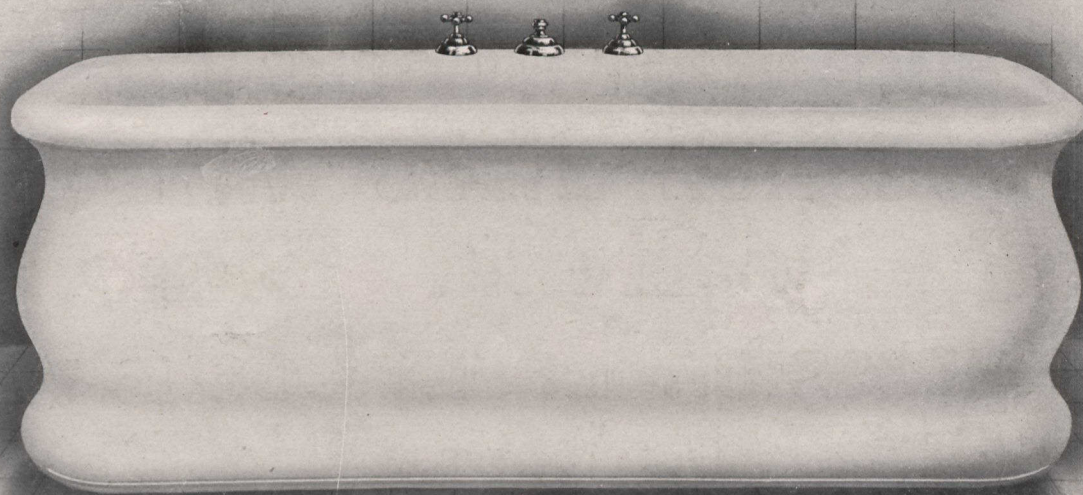
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